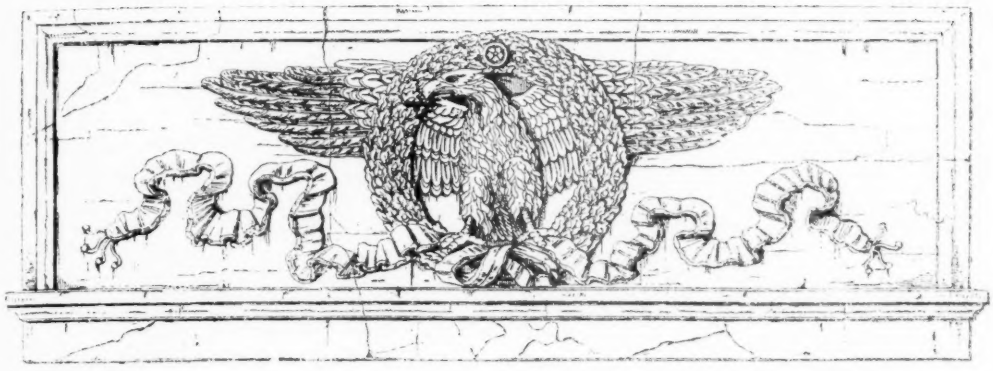


PUBLIC ABATTOIRS. By R. Stephen Ayling [*F.*].

Read before the Royal Institute of British Architects, Monday, 18th January 1909.

THE subject of my Paper is one which I introduce, not without some diffidence, from the fact that a slaughter-house, whether public or private, is naturally associated with taking the lives of animals in cold blood, when they are presumably in the best of health, and under conditions which preclude the slightest chance of escape. This, to the normal human being, naturally conveys a feeling of repulsion, which is to a large extent absent when the quarry, either fish, flesh, or fowl, is killed in a legitimately sporting manner for the purpose of providing food. Whilst human beings, however, remain carnivorous, animal food must be supplied; and in order to do this, buildings must exist for the purpose of slaughtering. From a humanitarian point of view it is our bounden duty to animals that they should be killed as painlessly, and under the best conditions possible; it is a duty to ourselves that meat supplied for human consumption should be free from disease; that those places in which the work of slaughtering and dressing meat foods takes place should be as hygienically perfect as possible; and it is an important matter of policy that by-products and other valuable materials should be utilised to their fullest extent. These essentials can only be achieved by the establishment of public abattoirs throughout the country, and by the elimination of private slaughter-houses.

It may be asked how these matters affect us as architects. In the future—and I sincerely hope the near future—when the public abattoir system is established as firmly here as it is to-day on the Continent, there will be a very wide field open for the English architect to design these utilitarian but certainly complex buildings, well planned and with a distinctive character.

The Germans claim to be pioneers in establishing public abattoirs. As early as the fourteenth century such buildings were erected in Germany, and even at that date laws were in force forbidding the butchers to slaughter cattle elsewhere. I think, however, that to France must be awarded the credit for erecting (about forty years ago) the first really comprehensive abattoir scheme—at La Villette, Paris – on lines the main principles of which are, speaking broadly, to-day followed in the finest Continental works. I shall refer in detail to these buildings later. It was not till about ten years afterwards that the subject was seriously considered in Germany, and since that time many hundreds of public abattoirs have been erected. By a gradual process of evolution, founded on practical experience, in many respects

the planning of German abattoirs to-day approaches perfection, and at the present time, in addition to the many existing buildings, new ones are being erected all over the country.

In England and Wales to-day we have nominally about ninety-eight public abattoirs, but nearly two-thirds of these buildings are very small, or obsolete in planning; in fact, a large number cannot be seriously considered as public abattoirs at all. Even if they were all satisfactory, this number would represent one institution to about every 330,000 inhabitants. As a matter of comparison, taking one-third of the existing abattoirs as being reasonably representative buildings—and this is certainly a liberal allowance—we have to-day in England and Wales one public abattoir to each million of the population. I think it is therefore apparent that we have hardly reached the fringe of an "abattoir system."

In Paris to-day there are two splendid municipal abattoirs, supplying the meat for the whole of the city, and not a single private slaughter-house. In London alone to-day we have about 294 private slaughter-houses, and not a single municipal one. The City Corporation Abattoir at Islington, and that at Deptford for killing foreign imported cattle, cannot be considered as such.

On the map of London [fig. 1] I have shown the disposition of the private slaughter-houses, licensed last year by the London County Council, in the area covered by the map published in the London Directory. The map shows 222 private slaughter-houses in that area, and it will be seen that in nearly every case they are in the midst of residential property. The positions are indicated by what, I think, may well be described as "black spots." Happily, licences are now only granted yearly to persons who conform to the regulations of the Council; but even under these conditions the fact that they should exist at all, many in populous districts and surrounded by houses, is an offence to humanity, hygiene, and economy. If the proprietor of every private slaughter-house in London rigidly complied with all the regulations of the London County Council and the suggestions of the Local Government Board, the system would still be a bad one. In making this statement I know that I am treading on controversial ground, but I shall endeavour later to support my contention that private slaughter-houses should be, and must be eventually, superseded by public abattoirs. Considering the matter simply from a hygienic point of view, it is somewhat surprising that whilst other civilised nations have forged ahead we have remained indifferent. We pride ourselves—and, I venture to think, justly—on the enormous strides we have made in sanitary science during the last fifty years, but on this particular subject we are at least a century behind our Continental neighbours. Recently plans have been prepared for a public abattoir in Constantinople, and the work either has been or shortly will be commenced. When this has been accomplished, London will stand in "splendid" isolation as being the only European capital without such an institution.

The results from the establishment of hospitals, sanatoria, public libraries, public baths, open spaces, and even sewage schemes are kept constantly before the "man in the street," whilst slaughtering is carried on in places hidden from sight; and the average citizen, so long as his meat-supply is palatable and apparently wholesome, remains not only indifferent but actually wishful to know nothing about the subject. Some short time ago an article appeared in the local paper of one of our largest provincial cities. The writer apologised for mentioning such a gruesome subject as slaughter-houses, and stated that he did so only from "sheer pressure of civic necessity," and concluded that "there were more attractive things to read about than slaughter-houses." For many years past I have been greatly interested in the subject, and should be the last person to disagree with this statement; but I feel very strongly that reform can only be accomplished when we have the courage boldly to face the "unattractive" subject, and candidly acknowledge that it is a really important one, rather than to shut our eyes to existing conditions and continue, if not in blissful ignorance, at any rate in blissful content.

Quite recently the question of erecting a public abattoir in a certain provincial town of about 49,000 inhabitants has been somewhat energetically discussed. The local paper stated in an article upon the subject that "nearly the whole of the private slaughter-houses within the borough could be closed on the ground of insanitation." The Medical Officer regarded this statement as a personal reflection on the work executed by him and the Sanitary Inspector, and in his Report to the Committee said that he only knew of "two slaughter-houses in the area that could be called insanitary." That any at all should be allowed to exist in the twentieth century, and in a well-regulated populous English town, can only be described as scandalous. It is not surprising that the Medical Officer of Health concludes his report by saying, "It is very desirable that a public abattoir should be erected for the town."

Presuming this case fairly to represent the average state of affairs, viz. one insanitary slaughter-house to every 24,500 inhabitants, on this basis we have to-day in the United Kingdom about 1,680 of these buildings. I have no hesitation in stating that this estimate is a low one. The legal machinery for closing them is inadequate and cumbersome, and only when Parliament seriously takes the matter in hand, as on the Continent, can any real reform be instituted.

In Germany and in other Continental countries public abattoirs have been and are being established in nearly every town of a few thousand inhabitants, and the private slaughter-houses compulsorily closed. A small measure of satisfaction may, however, be felt in the fact that in London the private slaughter-houses are being gradually closed, as 1,429 existed in 1874 in London alone, whilst there are now only 294, a diminution of nearly 80 per cent. of the number.

The time at my disposal will not allow me to enter fully into the question of the merits and demerits of the public *versus* the private slaughter-house, and I must therefore only briefly refer to these matters. A few of the demerits of the private slaughter-houses usually found in nearly every town or city may be summarised as follows:—

(*a*) They are generally situated in crowded districts, frequently behind the butchers' shops, and are often old stables or other buildings converted into slaughter-houses.

(*b*) Being scattered, direct rail or waterway transit is impossible, so that the animals to be killed have to be driven through the streets to the danger of the public.

(*c*) Being private property, only the Medical Officer of Health and the Sanitary Inspector have access to them; and as killing may be carried on at all hours of the night and day, it is physically impossible for these officers to be on the spot continually, and thus a large amount of diseased meat passes into the market practically without inspection. For instance, three years ago (and possibly the same to-day) one city in the kingdom with 110 private slaughter-houses employed two sanitary inspectors for the district. A portion only of their duties was to inspect the slaughter-houses and the carcases of the animals killed for food. Comment on the impossibility of these officers being able to do so efficiently is needless, even if the whole of their time were devoted to the work.

(*d*) For the same reason it is quite impossible to detect cases of cruelty to animals. That such exists, more from want of training of the slaughterers than from wanton brutality, cannot be doubted; yet whilst over 7,000 convictions were obtained last year alone by the R.S.P.C.A. for cruelty to animals generally, only fifteen convictions were obtained for cruelty in slaughter-houses in a period extending over the last few years.

As in London alone about 560,000 animals per annum are killed for food, it is obviously easier to detect the cases of cruelty in the public streets than in the private slaughter-houses. Again, the slaughterers only killing a few animals per month, or even year, cannot attain the dexterity or experience of those continuously engaged on this work, nor can the private

butcher afford to provide such apparatus for painless killing as can be supplied in the municipal institutions.

Having dealt with some of the demerits of the private slaughter-houses, I will now discuss shortly their advantages to the community or to the tradesmen. *They have none!*

The whole of the above-mentioned defects inseparable from the system of innumerable scattered private slaughter-houses are only a few of the most apparent. These defects can be, and are, prevented in the public abattoir. Almost invariably on the Continent (and sometimes in England) these buildings are erected in the suburbs, and in close proximity to a railway, so that the necessity for driving animals through the streets does not exist. Diseased meat sold for food is practically unknown owing to the employment of fully qualified veterinary inspectors, who are continually on the spot while animals are being killed. Wanton cruelty is reduced to a minimum, as the municipal buildings are under the fierce light of publicity, the officials are continuously in attendance, and only trained men are engaged as slaughterers.

I have been recently called to task in one of the professional journals for having the temerity even to discuss the question as to whether public abattoirs can be made to be self-supporting, the writer stating that such institutions are a necessity, and whether they are conducted at a profit or a loss is more or less immaterial. With this I am quite in accord; but I unhesitatingly state that if, when a public abattoir is built suitable for the needs of the district, properly managed, and the surrounding private slaughter-houses compulsorily closed, they can be, and should be, self-supporting or profitable. Even to-day in England, of our many public abattoirs, old and small as most of them are, and competing as they do with the private slaughter-houses, 41 per cent. of them are either self-supporting or profitable, even in face of the fact that in Birmingham there are about 131 private slaughter-houses, in Manchester 90, in Leicester 78 (and the list could be added to indefinitely), all competing with the one abattoir in each city. I think this result is not only eminently satisfactory, but even surprising.

In his book on *Slaughter-house Reform*, Herr Carl Heiss states that in Germany every one of the public abattoirs—and there are many hundreds—are without exception profitable, that the profits go towards reducing the rates, and that meat food has decreased in price and improved in quality. When we consider that the German and other Continental abattoirs are erected on a scale of magnificence which we should never dream of in England at the present time, this result is all the more astonishing.

I will now mention a few of the salient points which I think should be observed in a well-planned abattoir. Existing buildings of this kind can be, broadly, divided into two classes, those on the "block system," where all the main departments are under one roof, and the "separate system," where the main buildings are separated by roads or passages. The main buildings of a moderately sized abattoir consist of lairs for various animals, slaughter-hall, cooling-room, administrative block, superintendent's house, cold stores and chill rooms, destructor, buildings for the preparation of by-products and offal, workmen's mess-rooms, kitchen, baths, &c., and pathological room. An adequate site should always be provided sufficiently large to allow for future extension of the buildings. Where well-planned slaughter-courts, lairs, and cooling-rooms are provided, the other buildings are relatively easy to arrange.

In most of the old abattoirs the slaughtering was carried out in a series of chambers divided from each other by brick walls, with the result that such a system was little better than a series of private slaughter-houses, with the single advantage that they were concentrated instead of being scattered. I cannot too strongly condemn this method, which to-day is nearly obsolete, but unfortunately not quite so. This fact has led the authorities of some existing abattoirs (quite recently, for instance, at Edinburgh and Buda Pesth) to

abandon the old buildings and supersede them with others planned on modern lines. The more modern open-hall system has taken its place, and embraces the following good points—light, air, ventilation, ease of inspection, and facilities for keeping the place scrupulously clean.

It is generally acknowledged that animals, especially beasts, suffer pain or fear at the sight or smell of blood, and also that the flesh of an animal killed in fear deteriorates in quality. So that, not only from a humanitarian, but from a business point of view, the planning of the slaughter-hall should be so arranged that no animal is allowed to see another killed. This is difficult in the large open slaughter-hall where a number are being slaughtered at the same time, but the difficulty has been cleverly overcome at the Chatham Abattoir, to which I shall refer later. The lairs should naturally be placed near to the slaughter-courts, with easy access, but so arranged that no animal can see the work in progress. The cooling-room should either join or be near the slaughter-court, and be connected to it by overhead transit rails for conveying carcases. One cannot over-estimate the advantages of the cold store, and every abattoir, whether large or small, should be provided with this valuable adjunct. It enables the butcher to kill at his convenience, and to store his meat, till such time as it may be required for sale, in a perfectly healthy condition. The temperature is kept a few degrees below freezing-point, so that the meat does not require thawing, as in the case of imported frozen meat. I shall deal with the other buildings in the few notes on plans exhibited on the walls.

I am showing some illustrations of the magnificent Cattle Market and Abattoir of La Villette, Paris, designed by M. Janvier, and opened in 1867. Some idea of the size may be gathered from the fact that the plan is drawn to the scale of about 140 feet to the inch; the area is 105 acres, and about two and a half million animals are killed there per annum. The site is almost an ideal one for the purpose, as it is bounded on the east by the railway and on the west by the canals, one of which crosses the site in the centre, so that easy means of water transit are provided, which obviates the necessity of driving cattle through the streets and facilitates the work of removing refuse. The site is practically divided into equal parts, one half devoted to cattle markets and stables for live animals, and the other part for lairs, slaughter-courts, and cooling-rooms. Time will not allow me to describe the buildings in detail, but I may mention a few of the principal points in planning. Monday and Thursday are the market days for the sale of live animals, Tuesday and Friday are devoted to slaughtering, and Wednesday and Saturday for dressing and carting the carcases. On the market side are a large number of buildings for offices, caretakers, Customs officers, fire station, &c., and a magnificent old fountain removed from the Place du Chateau d'Eau. In the centre are three enormous markets for sheep, beasts, calves, and pigs, the largest covering an area of nearly five acres, all under a single roof. Separated from the market by the canal, spanned by bridges, approached by stairs and sloping ways, is the portion devoted to the abattoir proper. It will be seen that the main buildings consist of a number of blocks, on either side of which are lairs, with a waiting-court in the centre, and an equal number of blocks with cooling-rooms on either side and slaughter-courts in the centre. These buildings are arranged alternately, and each is surrounded by wide avenues, many of them well planted with trees. It is thus necessary to bring the animals from the waiting to the slaughter court, along roads at times greatly impeded by traffic. Practical experience has taught the lesson that the slaughter-courts are too narrow to allow of the necessary space for animals to be killed on each side. Many subsidiary buildings are placed on the other portions of the site.

At the time when these abattoirs were built scientific refrigeration was in its infancy, so that in the original scheme no provision was made for cold storage. A large cold store with refrigerating plant was erected a few years ago, but only of sufficient size to deal with the

meat supplied for the army. In recent years adverse criticism has been made on the planning of the northern half of the abattoirs, but it must not be forgotten that they were erected over forty years ago, and that the finest Continental abattoirs of to-day have been to a large extent built up on the "bones" of La Villette. These buildings can almost be compared chronologically with the hobby horse and the modern bicycle, and I think it is greatly to the credit of the late M. Janvier and his French colleagues that the scheme is still considered a magnificent one, the present-day German abattoirs only differing in detail rather than in principle. The Paris authorities, however, recognise the necessity for having increased accommodation for refrigeration, that improvement can be made in the passage of animals from the lairs to the slaughter-hall, and additional facilities for carting the meat. Quite recently, therefore, M. Léon Bonnenfant (one of the city architects) prepared a scheme embracing these requirements which was shown in a series of beautiful drawings lately exhibited at the Franco-British Exhibition. Since that time, however, some small alterations have been made, and owing to the courtesy of M. Léon Bonnenfant I am enabled to exhibit a plan and a bird's-eye view of the last project. As will be seen from the drawings, the general "lay out" of the main buildings is vertical rather than horizontal, as in the present buildings; and whilst the same accommodation is provided as in the present slaughter-houses, the means of transit and circulation are enormously increased. A large refrigerating-hall is placed at the end of each block of lairs and slaughter-courts. The estimated cost is about £1,000,000, and when completed will be the "last word" on this subject.

At the time La Villette Abattoirs were built it was thought they would be large enough to provide all the meat wanted in Paris, but this was found to be incorrect, and a smaller one was opened in 1897, designed by M. Ernest Moreau, architect, at Vaugirard, to supply the needs of the inhabitants on the left bank, viz. about a quarter of the population of Paris. The area occupied is about twenty-five acres, and over 600,000 animals are killed annually. The main buildings consist of four large blocks, similar in plan, and each containing lairs, waiting-court, slaughter-court, and cooling-rooms. The animals are enabled thus to be driven direct from the lairs into the large waiting-court, where they pass into the slaughter-court, are killed, and the carcases taken into the adjoining cooling-rooms. Many points which practical experience showed were defective at La Villette are here remedied, in addition to the great improvement in circulation and the space for cartage. At the old abattoir the slaughter-courts are 33 feet wide, and the work is carried on at each side; at Vaugirard they are 29 feet wide, and killing only takes place on one side. The remaining buildings on the site are the abattoirs for pigs and horses, offices, Customs House, auction mart, &c. I regret it is impossible to describe the two buildings more fully in detail, but to do so would occupy the whole of the time at my disposal.

As regards the architecture of these two groups of buildings I think a glance at the photographs and illustrations will make you agree with me that not only the planning but the exterior and interior treatment also is masterly. Without the slightest over-elaboration, these large utilitarian buildings are so impressive and suitable to their purpose as to compel admiration.

I am showing illustrations of three typical German abattoirs, viz. those at Berlin, Leipzig, and Offenbach. Any attempt to describe these buildings in detail would take up too much time, and I must therefore leave the plans to speak for themselves. They show the usual German arrangement of a cart roadway between the slaughter-hall and the cooling-rooms. In the most recent buildings this roadway is covered by a glazed roof. As in Germany not only slaughtering but the general work of an abattoir is carried out with almost military precision, the danger of contaminating the meat of the freshly killed animal by passing over the roadway

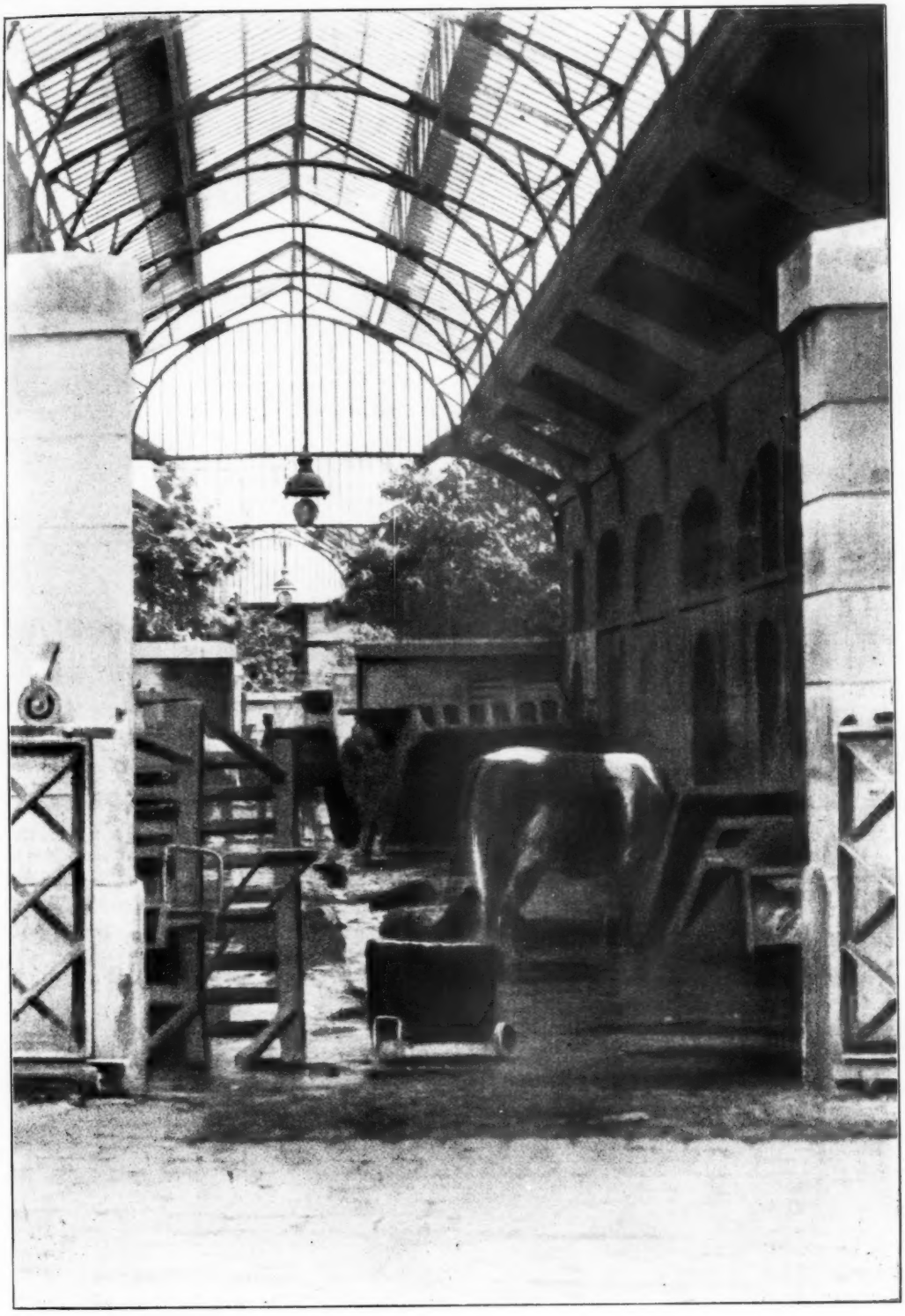


FIG. 13.—LA VILLETTE, PARIS: INTERIOR OF SLAUGHTER-COURT.

FIG. 4.—LA VILLETTE, PARIS: VIEW OF CLOCK TOWER AND AUCTION MART.

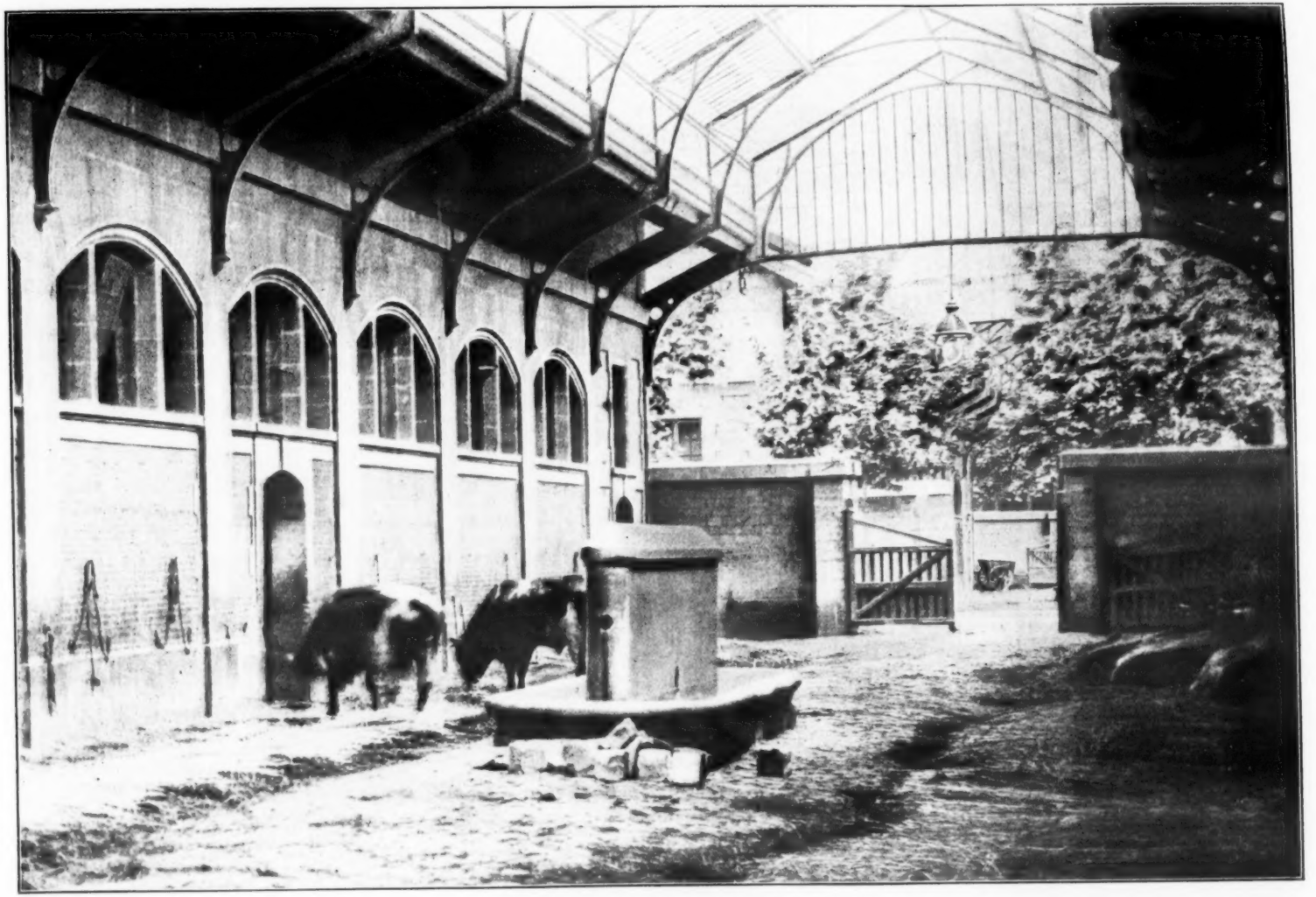


FIG. 5.—LA VILLETTE, PARIS : INTERIOR OF WAITING-COURT.

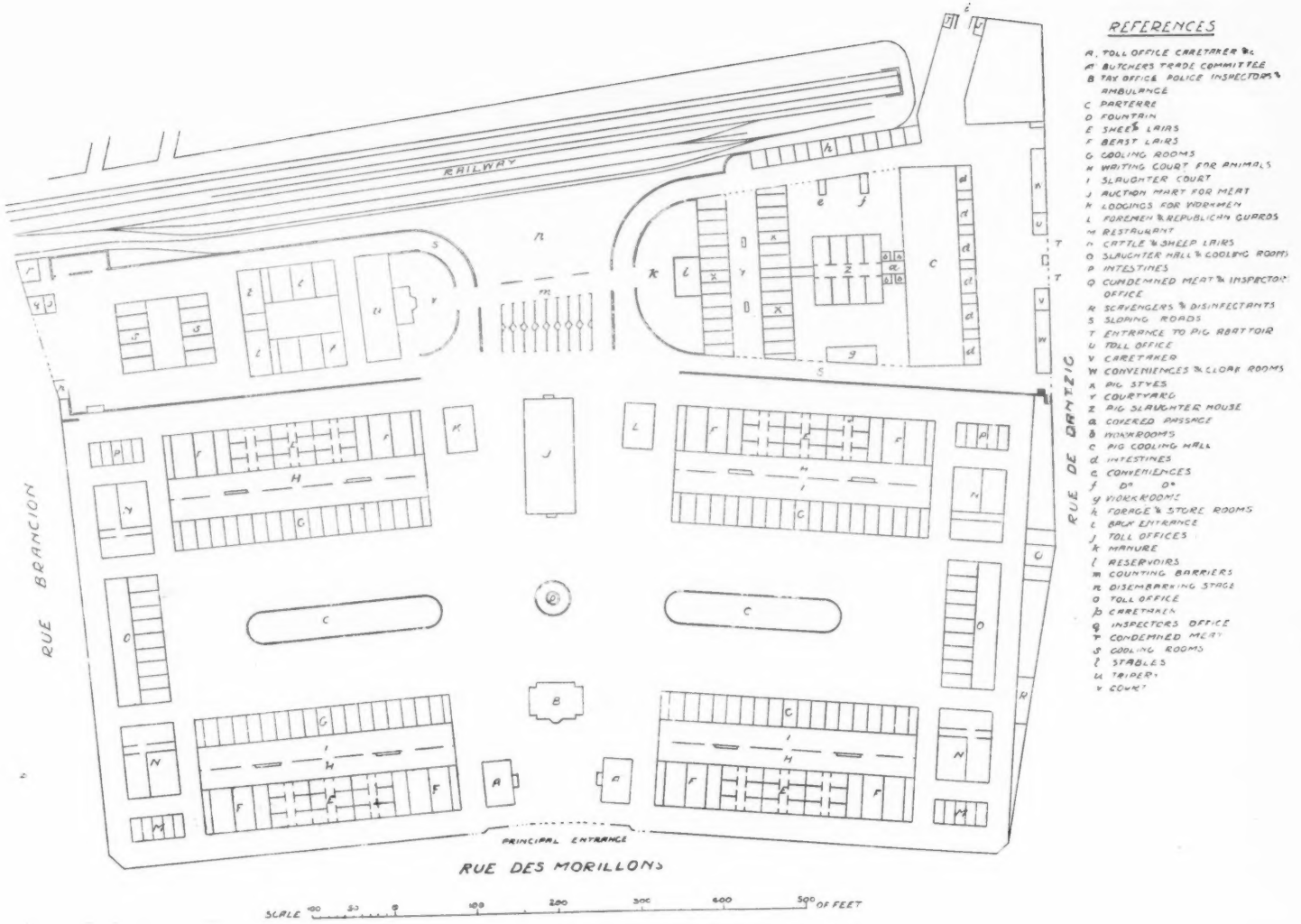


FIG. 5.—VAUGIRARD (LA RIVE GAUCHE), PARIS: BLOCK PLAN.

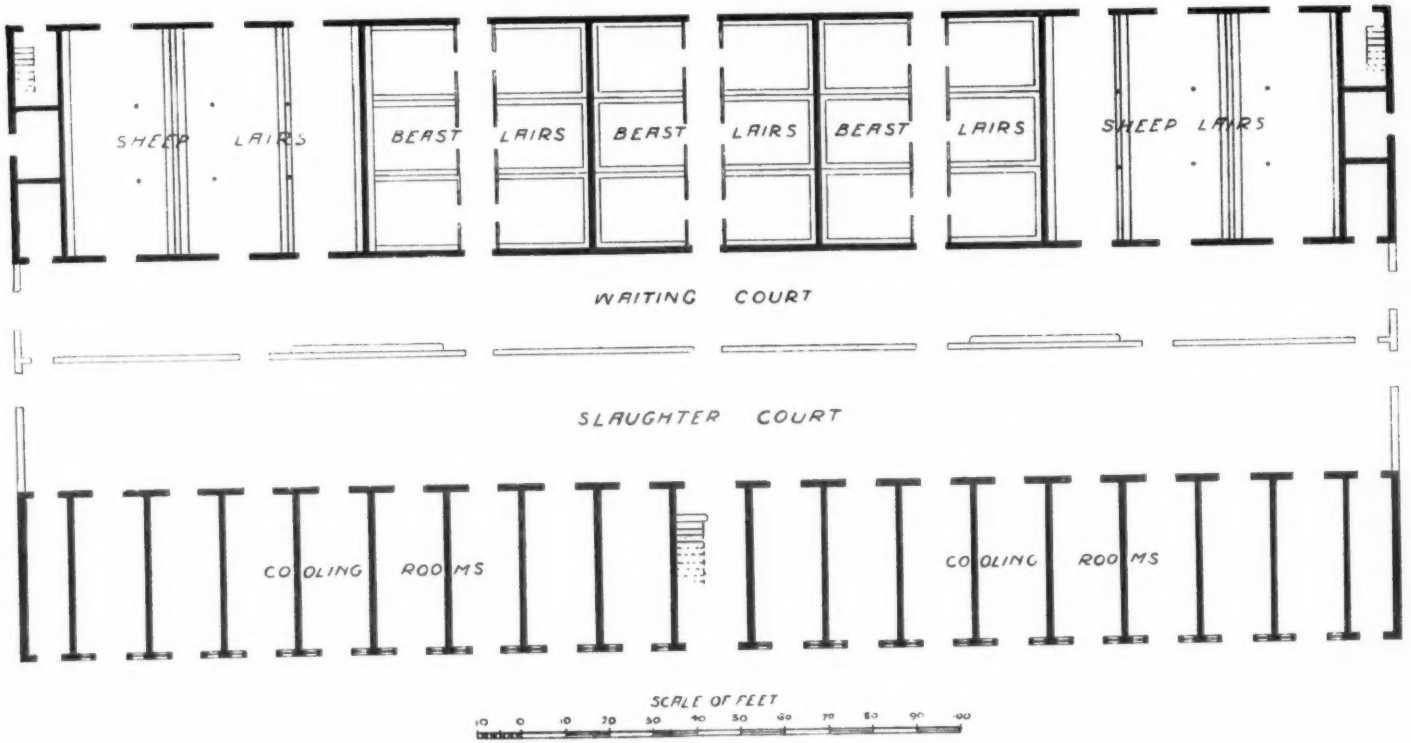


FIG. 7.—VAUGIRARD (LA RIVE GAUCHE), PARIS: PLAN OF LAIRS, WAITING AND SLAUGHTER COURTS, AND COOLING-ROOMS.

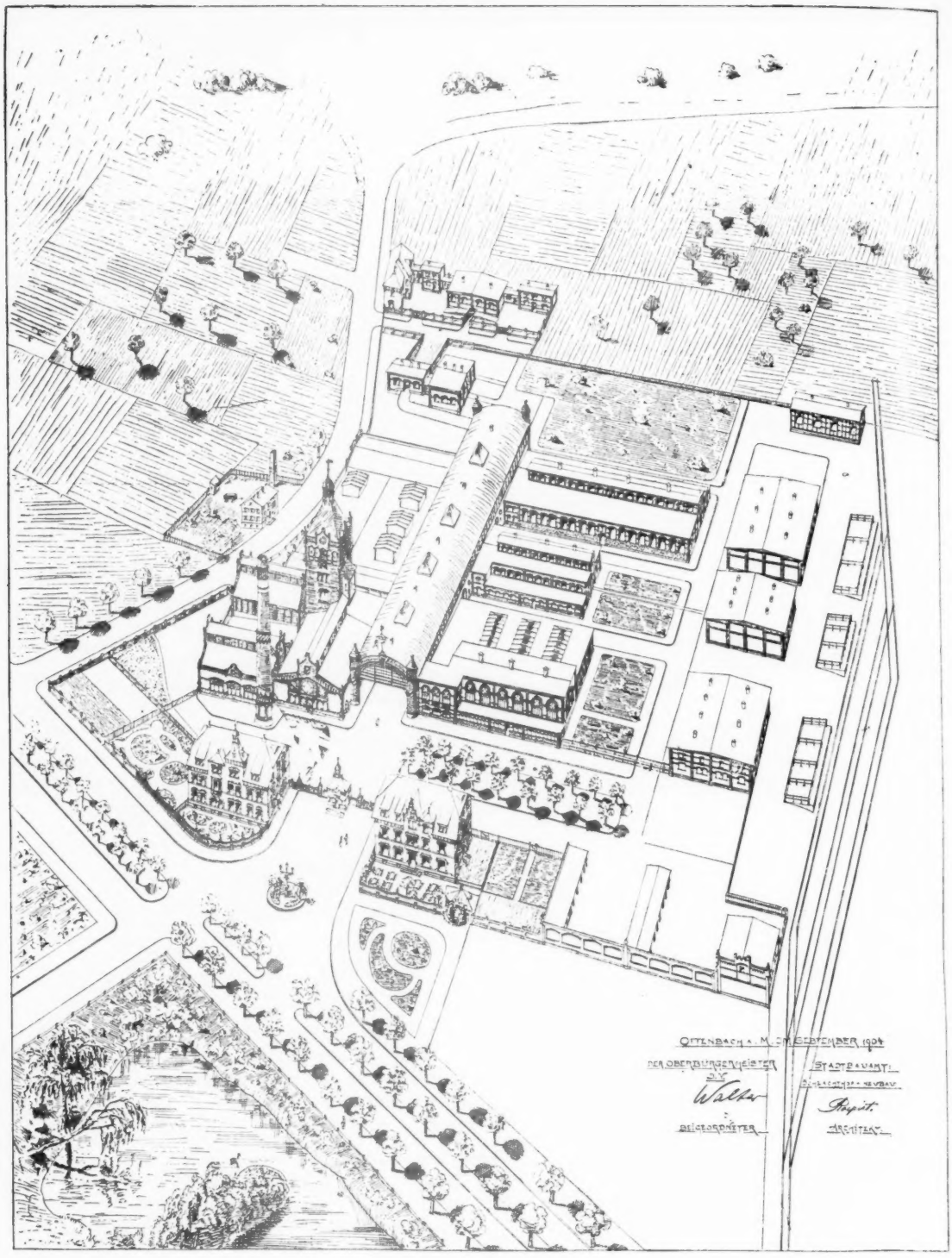


FIG. 8.—ISOMETRICAL VIEW OF PUBLIC ABATTOIRS AT OFFENBACH-AM-MAIN, GERMANY.

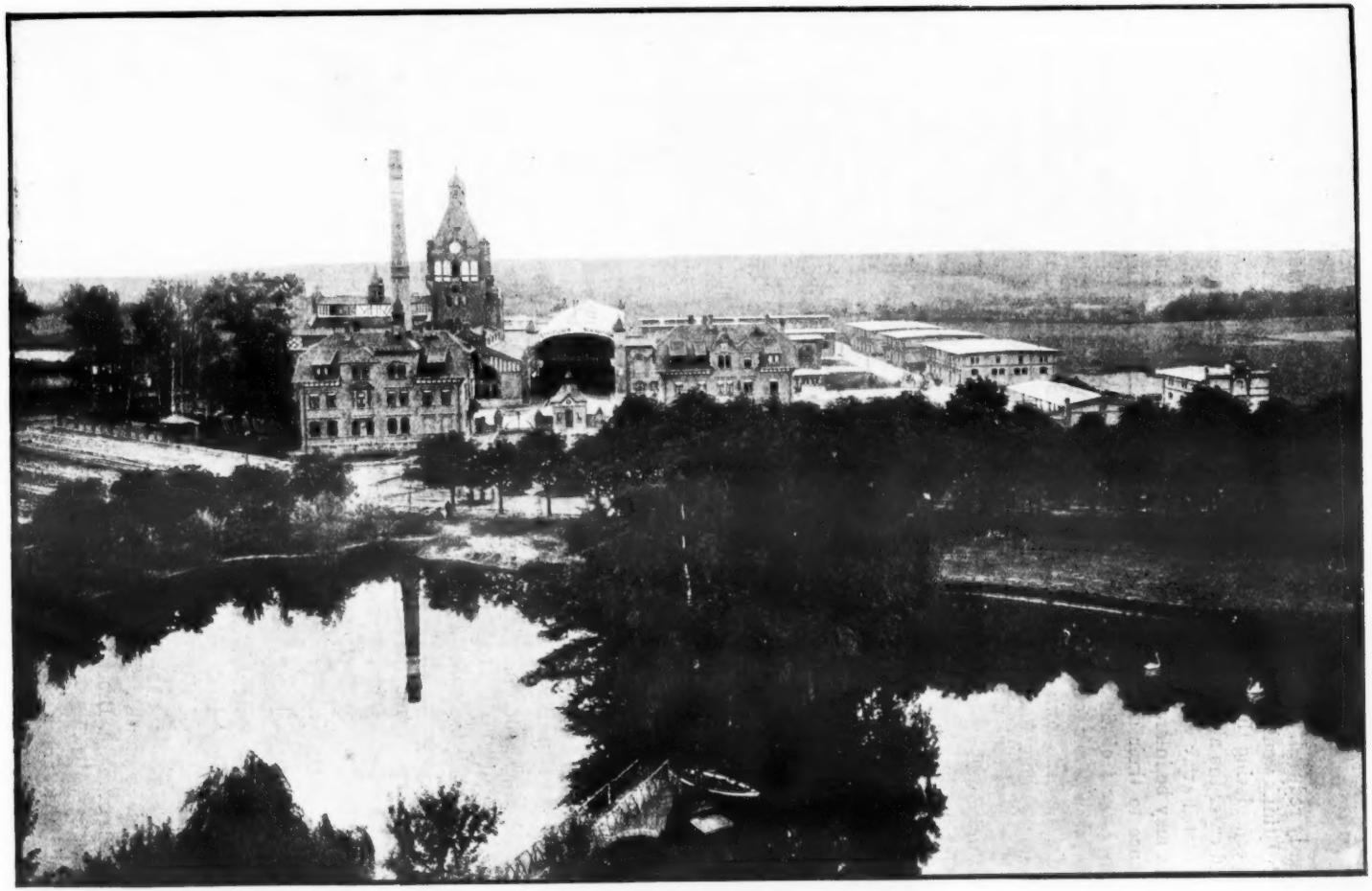


FIG. 10.—GENERAL VIEW OF THE NEW PUBLIC ABATTOIRS AT OFFENBACH, GERMANY.

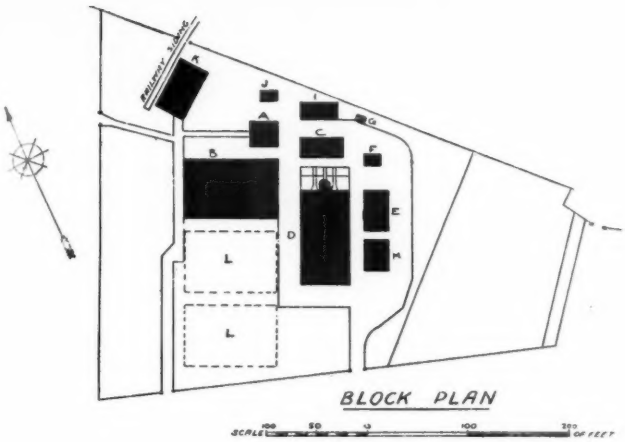
is greatly reduced. Stated hours are devoted to killing, dressing, and cartage, a procedure which I think would be almost impossible in England, and which was thought to be impossible when considering the new scheme at La Villette. As a broad principle, I think the animals should enter the abattoir at one end, be stabled, killed, the carcases dressed, cooled, and the meat carted away without having to pass through any open roadway.

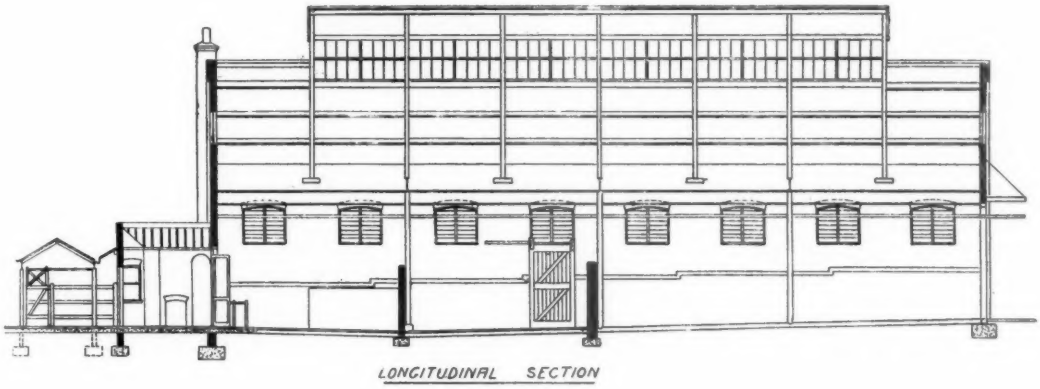
It may be interesting to note the broad views which our Continental neighbours take in reference to their abattoirs, frequently among the finest buildings in the city. An article in the *Lancet* of 26th December last called attention to the fact that the Birmingham municipal abattoir cost £126,989. While Birmingham spends nearly 5*s.* a head for its abattoir, the little town of Offenbach, in Germany, for instance, has spent £1 13*s.* 7*d.* per head of its 60,000 inhabitants.

The plan and photograph exhibited of the abattoir at Utrecht are most interesting, as they show a well-arranged Dutch installation.

Having thus briefly dealt with a few of the Continental abattoirs, I turn to the very limited field of those in England. Although not strictly a public abattoir, and although the installation is a small one, I think the plan of the abattoir at the Dockyard, Chatham, is the most perfect of those of which I have knowledge, not only from the humanitarian point of view, but as regards facilities for working. This plan is the outcome of many wise counsellors. In 1904 the Admiralty appointed a Commission to inquire into the question of the "humane slaughtering of animals," and the many witnesses examined were all experts engaged in those trades and professions appertaining to the subject. As a result of the deliberations, the main points in the report were as follows: "That animals awaiting slaughter should be spared any contact with the sights or smell of the slaughter-house; that waiting-pens should be separated from the slaughter-chamber by sliding doors; that floors should be impervious and not slippery; that cattle should be slaughtered screened off from their fellows; that immediately the carcases have been bled they should be dressed in an adjoining chamber, screened off from view of animals entering the slaughter-house." How admirably these recommendations have been carried out and how thoroughly they are practicable will be seen from illustrations on the walls. The animals about to be slaughtered are brought from the lairs and kept waiting in four covered pens, in the centre of which is the superintendent's office, with windows giving full command over the slaughter-hall into which the animals are brought from the pens. On one side of the slaughter-hall are dwarf division walls, about five feet high, extending half-way across the chamber, thus assuring all the advantages of the open hall with none of its disadvantages. In these compartments the animals are stunned and bled, and the floor washed down and cleansed before other animals are brought in. The carcases are then drawn into the meat-dressing room, where they are "dressed." This chamber is one which, I think, does not exist in any abattoir elsewhere, and it is difficult to over-estimate its many advantages. Here is executed the particularly dirty work; it promotes rapidity of working, obviates the necessity of draughty roads or passages between the slaughter-hall and cooling-room, and facilitates the removal of offal and refuse. A point not to be overlooked is that of easy inspection, as the intestines of each animal killed can be examined in conjunction with the carcase, and it is only under such conditions that really reliable examination can be made. The remaining buildings on the site are practically similar to those found in a well-planned scheme, and call for no special comment. The buildings were designed in the Admiralty Offices under the superintendence of Mr. J. Brooker Hunt.

On the walls are shown plans, elevations, and in some cases photographs, of a number of public abattoirs in England, most of which are interesting as a whole or in part. They show a diversity of plan, and it will be noted that most of the older ones are so arranged that


A SHEEP LAIR
B CATTLE LAIR
C FODDER STORE & VEGETABLES.
D SLAUGHTER HALL & COOLING ROOM
E OFFAL HOUSE
F LATRINES & COAL STORE
G SETTLING TANK
H DINING ROOM & STORE
I ROOT STORE
J MANURE PIT
K CATTLE DETRAINING POUND
L EXTENSION LAIRS
BLOCK PLAN
SCALE 100 50 0 100 200 OF FEET



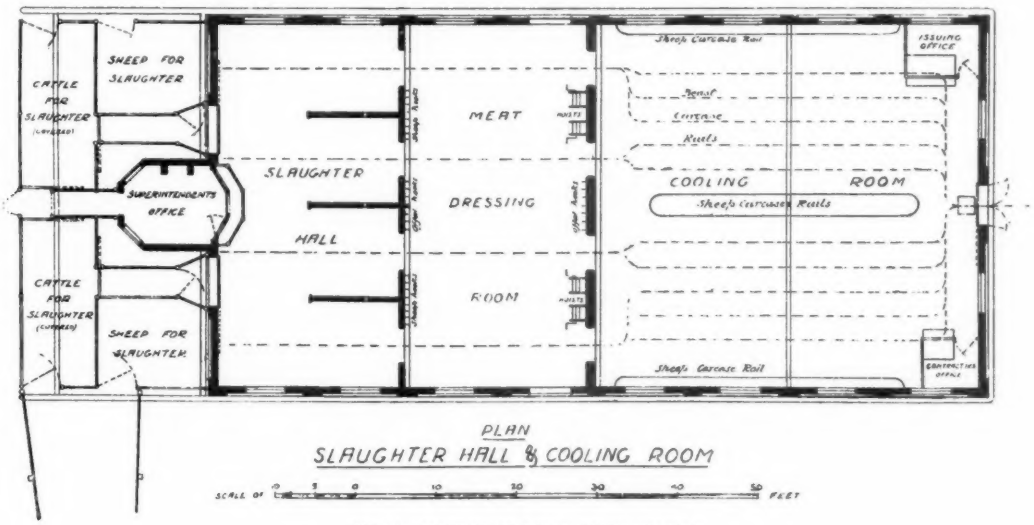
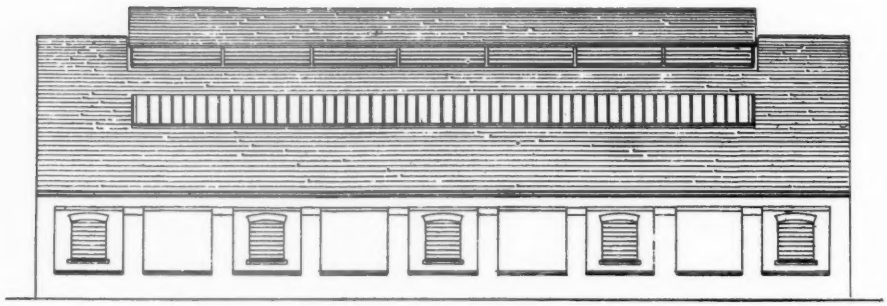
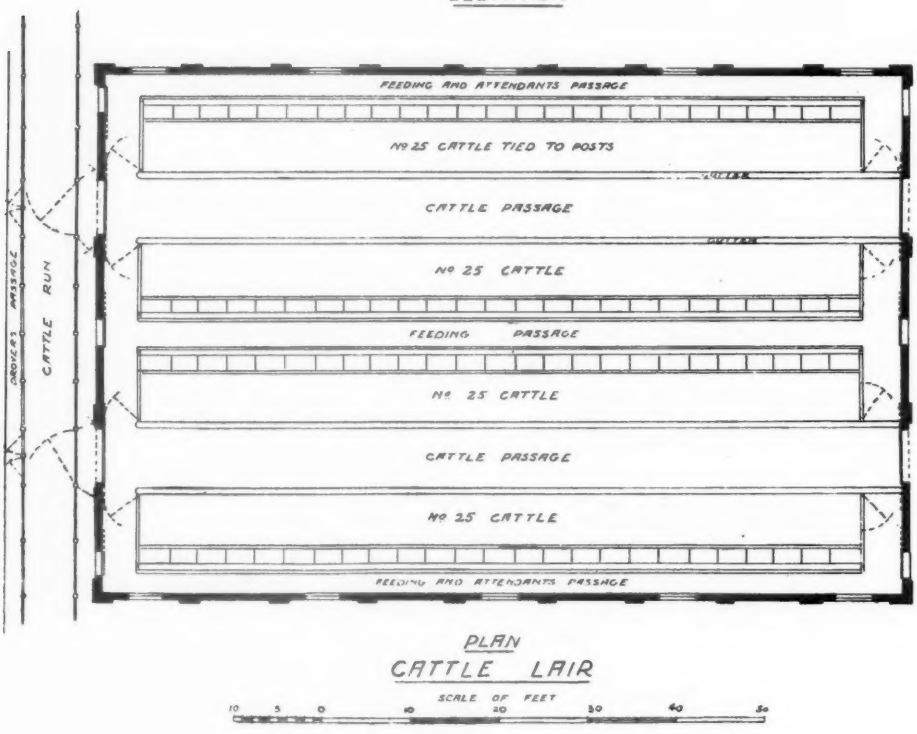


FIG. 11.—ABATTOIRS AT H.M. DOCKYARD, CHATHAM.

SHEEP LAIR



ELEVATION



PLAN

CATTLE LAIR

SCALE OF FEET

10 5 0 10 20 30 40 50

FIG. 12.—ABATTOIRS AT H.M. DOCKYARD, CHATHAM.

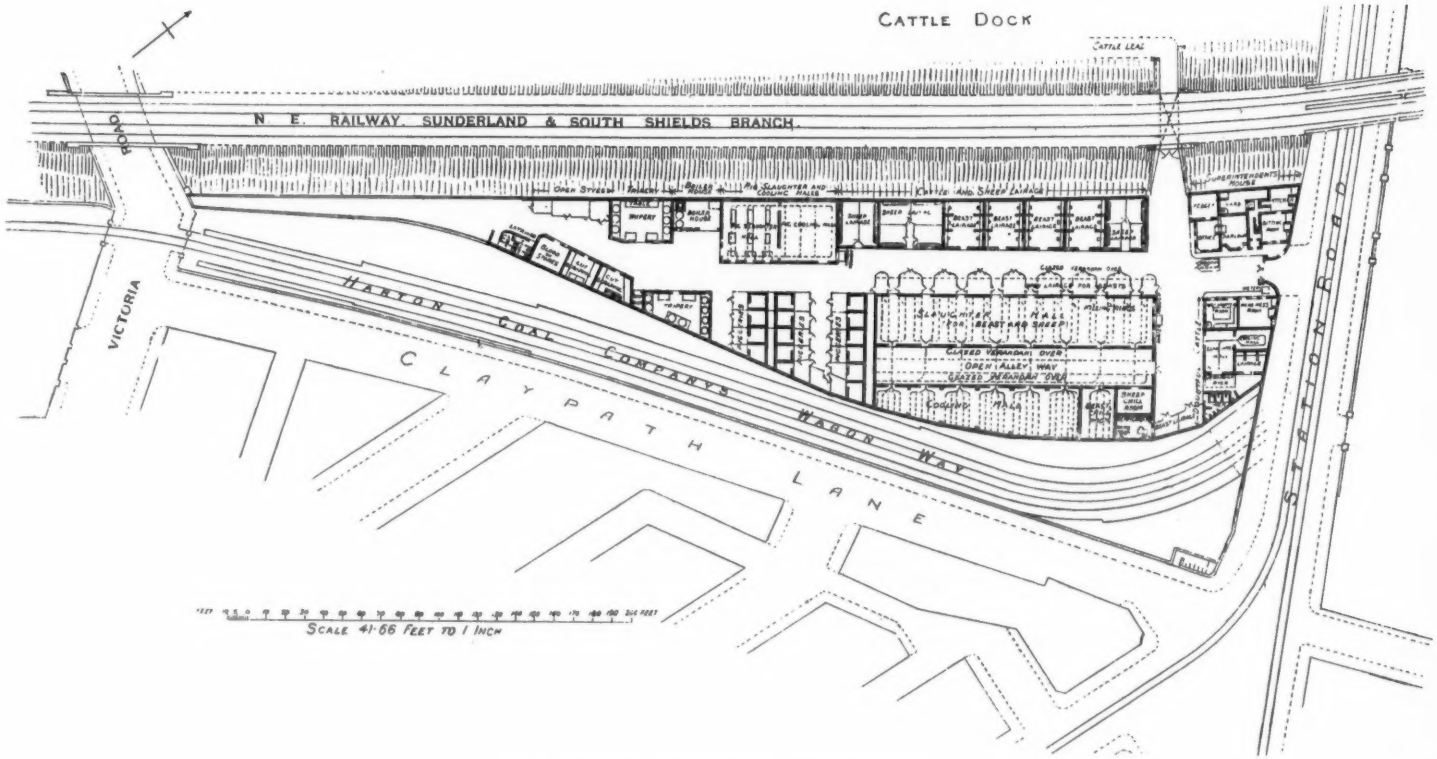


FIG. 13.—ABATTOIRS AT SOUTH SHIELDS: GROUND-FLOOR PLAN.

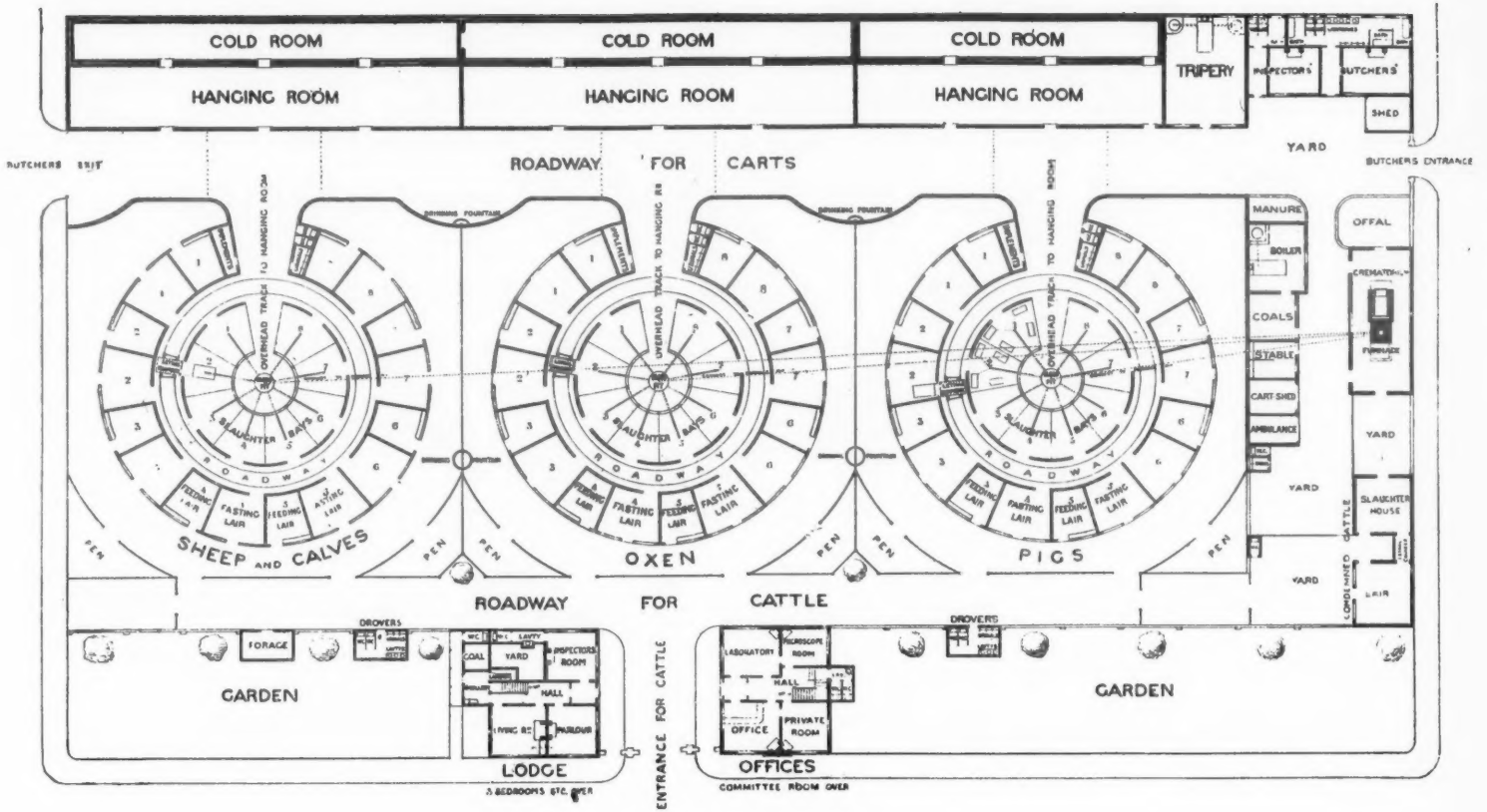


FIG. 14.—PLAN BY MODEL ABATTOIR SOCIETY.

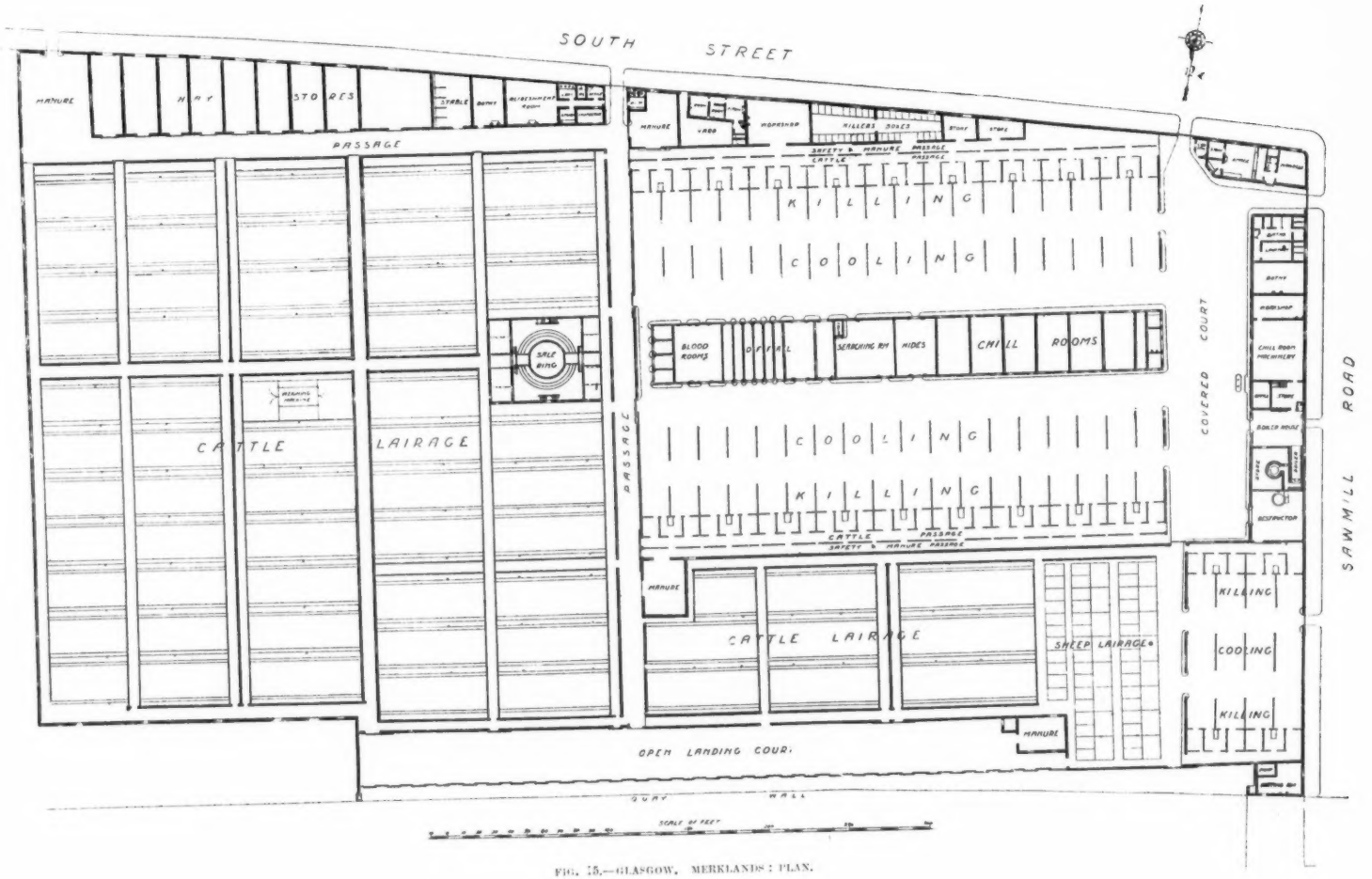


FIG. 15.—GLASGOW. MERKLANDS: PLAN.

each butcher has a separate killing-chamber, which is now generally condemned, whilst the slaughtering arrangements of the more modern buildings (such as that at South Shields) are on the "open-hall" system.

I am sorry that it will be impossible to discuss these plans separately, but I should like to draw attention to a few of them. The buildings at South Shields, opened in 1906, are those of one of the last public abattoirs erected in England. The site is irregular in shape, but well situated; and although the scheme is a small one, it is very complete and embraces the good points found in the modern Continental abattoir for a town of medium size. The slaughter-hall is separated from the cooling-room by a roadway (partly covered by glass verandahs) over which the carcases are conveyed on overhead rails. I think, however, that it is better to convey the freshly killed carcases directly from the slaughter-hall to the cooling-rooms on overhead rails without necessitating passage through an open (or partly open) roadway impregnated with dust.

A unique plan was suggested by the Model Abattoir Society some years ago, and the plan is shown in fig. 14. The scheme was formulated by Mr. Bertram Richardson in conjunction with his father, the late Sir Benjamin Ward Richardson, and drawn by our colleagues, Messrs. Unsworth and Newberry. You will readily observe that the plan is not to scale, as the pavilions for pigs, sheep, and beasts are of similar size. It is, however, interesting and suggestive.

The idea that every animal should be rendered insensible by being placed in a lethal chamber before killing naturally appeals very strongly to our humane instincts, and it has been proved by experiment that the flesh of the animal after such treatment is in no way deteriorated. The three main buildings are circular, and consist of an outer range of lairs, whilst a roadway separates these from the slaughter-bays. The roadway is laid with tram lines, on which a lethal chamber is arranged. Thus the animals would enter this chamber from the lairs, be rendered unconscious, and then taken into one of the slaughter-bays, killed, and the carcases dressed. Another feature of this plan is the admirable facility for inspection, as the veterinary inspector, standing in the centre enclosure, has full command over the whole of the slaughtering operations. The late Sir Benjamin Ward Richardson experimented on a large number of animals in a West-end slaughter-house, and it was found that not only was lethalising perfectly practicable, but that the animals suffered no pain, the flesh was not injured, and was afterwards sold in the usual way of trade. Whether, however, such arrangements could be made practicable for a large abattoir is, I think, somewhat debatable.

In the foregoing remarks I have not mentioned the abattoirs of Scotland. To-day, out of 205 burghs, 124 of them, or nearly 61 per cent., have public abattoirs and greatly added powers for closing the private slaughter-houses. The Local Government Board of Scotland is now very rightly advocating the erection of public abattoirs in or near all towns. A radius of five miles is suggested for towns with from 6,000 to 8,000 inhabitants. Scotland is certainly much in advance of England, and is gradually approaching an "abattoir system."

As regards materials, in the erection of these buildings wood should be used only where absolutely necessary. Stability and facilities for scrupulous cleanliness must be the keynote. The floors must be of perfectly impervious material, and white glazed brickwork or tiles largely used in the interior of the buildings, so that every trace of dirt or blood may be easily detected and removed. A writer recently in one of the journals advocated the use of brown salt-glazed bricks for the dado of the killing-courts, as traces of blood on this material would not be apparent. It is difficult to understand the reason of such a recommendation, although it has been adopted in one of the last abattoirs erected. Brickwork, cemented and distempered at frequent intervals, would be infinitely better if the initial cost of glazed brickwork or marble, as some-

times used in Germany—is prohibitive. Throughout the buildings very light paint—preferably white—should be employed.

The question whether public abattoirs should or should not be adopted appears to me a national rather than a political one, so that I am somewhat unwilling to mention such a vexed question as "imports." But last year we imported into the United Kingdom considerably over £50,000,000 worth of meat food. A very large proportion of this comes into the country and is sold by the retailer practically without inspection. The live animals imported and killed at Deptford and other foreign animal wharves are certainly under veterinary inspection, but they only represent one-fifth of our foreign and colonial meat-supply. A large portion even of this meat is sold as "home-killed," which to the average purchaser conveys the idea that it is English. I am strongly of opinion that a general "abattoir system" would encourage the British farmer to raise home-grown cattle, which would not only be to his pecuniary advantage, but also benefit the British consumer.

In conclusion, I should like to say a few words on the main reasons why public abattoirs have not superseded private slaughter-houses in this country. They may be summed up in four words, "trade opposition" and "vested interests." Trade opposition is very strongly against the abattoir system, as under it inspection of meat would naturally be more stringent than is possible at the present time, so that diseased meat food would be condemned in a much greater proportion.

It is acknowledged that even the greatest expert is frequently unable to detect tuberculosis in an animal whilst it is standing in the cattle market, so that a butcher may buy an animal in good faith and after killing find the carcase is either partially or wholly unfit for human consumption. The question as to whether he should be compensated under these conditions was discussed at great length by the Royal Commission on Tuberculosis. Four of the Commissioners considered the matter "a trade risk," whilst the other three recommended compensation to the extent of one-half of its value, provided that the animal had been bought without any intent to defraud, and that a reasonable price had been paid for it.

As regards compensation for compulsorily closing private slaughter-houses when a public abattoir is built, the Commissioners were unanimous in the recommendation that no compensation should be paid, but that the owners should be allowed three years to convert and apply their premises to other purposes. Personally I am in favour of reasonable compensation in either case. I find in *Our Slaughter-house System*, by Messrs. Cash and Heiss, that when the closing of private slaughter-houses in Germany was made compulsory the sum of £85,000 was claimed from twenty-two towns. Government arbitrators were appointed and only £11,360 paid, an average of £493 per town, or 13 per cent. of the amount claimed.

There is little doubt that many butchers holding licences only continue to do so waiting for the time when the buildings will be closed and compensation given. This is proved by the fact that at the last licensing meeting of the L.C.C. a number of licences were opposed, and some refused, on the ground that practically no slaughtering had taken place during the year. Why the cattle breeders and farmers oppose public abattoirs is a little more difficult to understand.

Some few years ago it was proposed by the L.C.C. to erect six large abattoirs around London, and had this scheme been carried out one of the greatest hygienic reforms of the century would have been accomplished. But once again trade opposition succeeded, and the proposed work was abandoned. A few months ago the subject was again brought forward, with the same unfortunate result. How long a public necessity is to be shelved owing to the well-organised opposition of a few interested persons, it is difficult to say.

To the Humanitarian League credit must be given for its strenuous endeavours to

promote the abattoir system. Many pamphlets have been published by the League on the subject, but these only reach a limited number of persons interested in the matter. Powerful trade opposition and public apathy have still to be overcome. The R.S.P.C.A. have recently circulated a very interesting pamphlet, giving facts and figures, entitled a *Plea for Public Abattoirs*.

More than once we have discussed in this room the question of "official architecture." Abattoir buildings complying with various requirements, complex engineering work, elaborate sanitary work, considerations of humanity in stabling and slaughtering, the most efficient methods of veterinary inspection, &c., all tend to render them practically impossible to be designed by a single individual, however talented. In any large abattoir scheme the architect, engineers (constructional and municipal), medical officer of health, and veterinary surgeon should work together harmoniously.

Whether in England we shall awaken from our inertia during the next year, or the next century, is a matter I must leave in the "lap of the gods."

List of Illustrations exhibited at the Meeting.

Map of England, showing situation of Public Abattoirs with and without Cattle Markets attached.

Map showing the existing private slaughter-houses licensed by the London County Council in the area covered by the Map published in the London Directory.

La Villette, Paris: General Plan; Plan, Elevation, and Section of Slaughter-court and Cooling-rooms, and plan of Lairs and Waiting-court; Detail of Lairs, Waiting-court, Drinking-trough, and division of Sheep Lairs; Part Plan, Elevation, and Section of Beast Market; Exterior and Interior, Photographs of various Buildings; a Plan for the proposed reconstruction of the northern portion of the Abattoir at La Villette; Bird's-eye View of ditto.

La Rive Gauche (Vaugirard): Block Plan of the Abattoir; Detail Plan of Lairs, Waiting-court, Slaughter-court, and Cooling-rooms, Interior and Exterior Views of various Buildings.

H.M. Dockyard, Chatham: Block Plan, Plans, Elevation, and Section.

South Shields: Plan, View of Slaughter-hall and Cooling-hall.
Carlisle: Plan of Abattoirs.
West Hartlepool: Block Plan and Plan.
Barrow-in-Furness: Block Plan and Detail Plans.
Birkenhead: Plan.
Cheltenham: Plan and Elevation.
St. Annes-on-Sea: Block Plan and Detail Plans.
St. Helens, Lancashire: Plan.
Birmingham: Plan.
Leeds: Plans and Elevations.
Huddersfield: Plan.
Glasgow, Merklands: Plan.
Dundee: Original Scheme, Plan; Bird's-eye View.
Model Abattoir Society: Sketch Plan.
Dublin: Plan.
Berlin: Plan.
Offenbach: Plan, Bird's-eye View, and General View.
Buda Pesth: Bird's-eye View and General View.
Utrecht: Plan.
Leipzig: Plans and Views.

Most of the illustrations on foregoing pages are reproduced, by kind permission of Messrs. E. & F. N. Spon, from Mr. Ayling's recently published book on *Public Abattoirs*. The photographic views of La Villette, Paris, are printed from blocks used in the production of Mr. Ayling's book, and have been kindly lent by the publishers for the present purpose.

DISCUSSION.

Mr. Ernest George, *President*, in the Chair.

Mr. SYDNEY PERKS, F.S.A., the City Surveyor, rising at the invitation of the President, said the remarks he wished to make would be in the nature of a protest. Mr. Ayling had carefully considered many plans, but he (Mr. Perks) had looked at the names of the different engineers and architects on the plans exhibited, but had failed to find on any one of them the name of the author of the Paper. Even if Mr. Ayling had never carried out an abattoir, which apparently he never had done, he might at least have drawn up some model plan of his own to be a guide to those who had to design such buildings. What he particularly wished to protest against, however, was the statement in the Paper that "in London alone to-day we have about 294 private slaughter-houses and not a single municipal one." Mr. Ayling also stated: "Recently plans have been prepared for a public abattoir in Constantinople, and work either has been or shortly will be commenced. When this has been accomplished, London will stand in 'splendid' isolation by being the only European capital without such an institution." If Mr. Ayling meant by "municipal" that not a single slaughter-house had recently been put up at the expense of the rates he was perfectly right. They had, however, a great improvement upon that; for a large abattoir had been erected for the public good without a penny coming out of the public pocket. The Corporation of London was the food authority for London: it had the principal markets, and it boarded all ships coming up the Thames and inspected the food. The Corporation of London had spent between £30,000 and £40,000 on putting up public slaughter-houses at Islington. Those slaughter-houses had been contemplated for some years, and a committee had visited the best slaughter-houses in Germany and the principal slaughter-houses in England, and as the result of many years' thought the abattoirs at Islington had been built and were opened by the Lord Mayor in state a little over a year ago. Those slaughter-houses were public, but the inference seemed to be, from Mr. Ayling's Paper, that they were not public. Anyone could go there and kill a pig for sixpence, a bullock for eighteenpence, a calf for threepence, or a sheep for twopence, and there was in attendance a fully qualified veterinary surgeon, with a staff of assistants, to see that it was properly done. Humanitarian and sanitary improvements would be found there that did not exist in any other abattoir in England and in very few abroad. One large municipal authority recently had appointed a committee to visit the principal slaughter-houses on the Continent. On their return they visited those put up by the Corporation at Islington, and they declared it to be far finer, as regards equipment, and more satisfactory than anything they had seen on the Continent. At Islington no money had been spared in order to get the most perfect sanitary and humanitarian appliances, but not a penny had been spent on architectural work. The instructions were that the building was to be of stock brick, and there was no ornament of any kind about the buildings. The monotony of the long range of buildings was not, however, without a certain charm. Inside it would be found that no regard had been paid to cost or to recoupment. The Corporation did not care whether the buildings paid or not; they were erected to be the finest slaughter-house that could be put up from the humanitarian point of view. For instance, over £2,000 had been spent on electrical hoists for raising the beasts after they had been killed, and about £1,000 had been spent on what was known as the Podewil destructor, a wonderful German invention which enabled them to get rid of all diseased meat. He (Mr. Perks) had devoted considerable study to the subject, but he did not wish to criticise the Paper. He was interested in the Corporation of London, and he felt he ought to make some protest, so that it should not go forth that London was doing nothing; this, he was sure, the Institute would regret. There were a lot of practical points in connection with the subject which he should like to go into at another time.

Mr. J. C. NICOL [*A.*] said that some ten years ago he had had the opportunity of visiting most of the slaughter-houses on the Continent for one of the important corporations which had been mentioned that evening, and he must say that he quite agreed with some of the remarks made by the last speaker. The lecturer had put together a large amount of information which was very difficult to obtain, but he was rather disappointed that he did not refer more to what had been done in the Provinces. London, no doubt, had done at Islington very good work, but not until after the Provinces had shown them what might be done in a similar way. In a slaughter-house design it seemed advisable not to follow the French system, where they had the opportunity of laying their ground-plan out almost to any extent. Most of the abattoirs on the Continent seemed to be on the same plan. The buildings at La Villette had been very much improved, but the plan there adopted would not apply either to London or to the provincial towns in England, for the simple reason that they

had not the land in the centre of the cities to devote to this purpose. The Birmingham Corporation erected a large-sized slaughter-house upon rather a restricted area of ground; it was necessary to economise the land, and the expedient was adopted of putting the stables on the top of the slaughter-house. The stables were approached by an inclined plane, and the arrangement was found to work very well indeed. He thought the lecturer had made too much of the sentiment of slaughtering. He had never seen any indication of fear or suffering in the eye of an animal when looking at another of its kind being killed. There were always busybodies about slaughter houses who wanted to put blue spectacles upon the animals and leather covers &c. over the eyes and head; but these only served to distract the slaughter-man in the execution of his important work. In the hands of a good sober slaughter-man the pole-axe had been found to be the most effective weapon. In the Provinces some of the abattoirs were very paying institutions when combined with markets. There was a general desire there to have the public slaughter-house close to the market-place. The simplest method was to bring the animals direct to the slaughter-house either from the side stables or from those above, without an intermediate pen; one animal could be brought down at a time, and while being killed in a properly enclosed slaughter-house the next animal could be got in readiness. He thought that in England it was best for climatic reasons always to have abattoirs and markets under a continuous roof, including the carting ways. A most important thing was the designing of the fittings for the slaughter-house. The carrying gear was far more important even than the architecture of the building itself. Walls and shed roofs gave some opportunity for an architect to display his skill; but the designing of the fittings, the carrying gear from the slaughter-house to the market, the hoisting of the carcases and taking them to the chill-rooms and refrigerating-rooms, required skill to avoid handling the carcases. Germany had been well to the front in this matter, and reference might be made to the work of the firm of Messrs. Herbert Morris & Bastert, who introduced the carrying gear into this country. It was from this firm that he got the detailed information which was obtainable in Germany ten or twelve years ago, when such arrangements were not to be seen in England. This matter of public abattoirs was a subject which he hoped would be brought before the general public and the municipalities throughout England. The effort the lecturer had made to bring this about was a step in the right direction, and such practical Papers as his ought to receive encouragement. The planning of the most simple building required skill and attention, and he thought the courage the lecturer had displayed in coming forward with this Paper on a subject which was not a very savoury one was much to be commended.

MR. J. NIXON HORSFIELD [*A.*], in moving a vote of thanks to Mr. Ayling for the trouble he had taken in preparing the Paper and putting it before them, said that the subject appealed to him simply as an outsider who had been to Chicago, had visited the stock-yards there, and had regretted having done so. Therefore he could sympathise with the movement for handling in a clean and wholesome manner the necessary work of the stock-yard. There was nothing in the subject particularly attractive to them as architects, but they ought not to disdain to do what they could architecturally to express the effort to clean up the stock-yards. If slaughter-houses were abolished and stock-yards and abattoirs instituted as on the Continent, architects might hope to be allowed to help in making them worthy of modern civilisation. If they did so they should, he hoped, be able to avoid the criticism which was made so famous in *The Jungle*.

THE PRESIDENT said he thanked Mr. Ayling very heartily for his admirable Paper. The remarks of subsequent speakers had been very interesting, especially those of Mr. Perks, who had given a thoroughly English example of a building made sumptuous inside, but with all attempts at architecture abstained from outside. He was afraid that would generally be the method with us.

MR. AYLING, in responding to the vote of thanks, said that Mr. Perks had remarked upon not seeing his name as architect on any of the plans exhibited on the walls. That was his misfortune, not his fault. He hoped, however, if he lived long enough, to be commissioned to design an abattoir, but it would not be on the lines of that at Islington. Mr. Perks had rated him for not calling the Islington building a public abattoir. But it was not. It was built by the City Corporation; the money did not come out of the rates. The buildings had cost £32,000; they were very small and could never be made to pay. This fact was frankly acknowledged at the opening ceremony. In the Islington buildings there were electrical hoists, and in addition, in case the electrical hoists should go wrong, there were hand-hoists. Slaughter-men, however, were not weaklings, and he maintained that two sets of hoists were not necessary. He quite agreed with Mr. Perks that there was nothing wasted outside, but he did think there was a lot wasted inside, and that many important points of planning were open to criticism. Mr. Nicol had mentioned that they had not room in the centre of London to build on such broad and comprehensive lines as at La Villette. He perfectly agreed. His contention was that they should not build in the centre of London, but in the suburbs, where there was plenty of room. As regards the pole-axe, in the hands of a very expert slaughterer there were few better implements, but many slaughterers were not expert. As to the various forms of pistols and the last implement brought out by the Society for the Pre-

vention of Cruelty to Animals, there was no question about it—it was direct and painless. He had not mentioned particularly the provincial abattoirs because he had not time; but the map he had prepared showed rather an interesting fact, that if a line were drawn from the Wash down to the south of Wales he believed that about one tenth of the existing abattoirs in the Provinces would be found below that line—which was practically the half of England—and about nine tenths above.

Public Abattoirs: Architectural Considerations.

11 *Little College Street, Westminster:*
20th January 1909.

To the Editor JOURNAL R.I.B.A.,—

SIR,—I listened to Mr. Ayling's Paper on public abattoirs with much interest, and it had been my intention to raise certain points conflicting somewhat with his general conclusions; but under the circumstances I felt that any further criticism at the moment, however impersonal, might appear ungracious.

Mr. Ayling made out a very good case for the establishment of public abattoirs in the general interest of public health and the humane treatment of animals, but not in the interest of those unfortunate beings who are doomed by the force of circumstances to live and work in them. I suggest that the creation of large buildings on the lines proposed, and the necessary concentration of workers, tends to aggravate the evil of their abnormal environment, and that the public gain is partly at the workers' expense. Civilisation may demand its victims—its martyrs—but let us show at least as much humanity to men as to animals. It seems to me that the arrangement of an abattoir should show at least as much consideration for the actual feelings of the human workers as for the somewhat problematic feelings of the animals, and that it is only a plan that is dominated by this consideration that has sufficient human interest to have any claim to be considered architecture. I should have liked to ask Mr. Ayling whether it was possible so to design an abattoir as to permit the lives of the workers to approach the normal, and it is because I doubt this that I also doubt the propriety of considering an abattoir as architecture.

There are certain facts of life which we recognise as facts, but which we all refuse to recognise as fit subjects for art. I suggest that this is one of them. Take it how you will, the deliberate, cold-blooded slaughter of tame animals is not an inspiring theme: it bears the same relation to the pursuit of wild animals as cold-blooded murder does to battle. Imagine a picture or a statue of a butcher killing a pig! Imagine a symphony of slaughter or a sonnet to a slaughter-house! Is it easier to imagine the possibility of making an expressive work of art of such a building? The more the nature and function of the building is expressed outwardly—the more this expression is heightened and intensified—the more horrible the result.

Granted that such buildings must be, and that in their technical aspect they may come within the province of the architect, yet, I submit, they are not fit subjects for deliberate artistic expression; although it is possible that by refraining from any conscious expression of the nature of the building, by doing nothing to draw out or heighten this expression, we may arrive at a certain negative expression—the expression of the fact that the subject is unfit for publication. From this point of view it might be well to hide them underground like a public convenience, but if this is not practicable, they might be surrounded by a high blank wall; then if we were to write over the gateway, in the language of the animals, "Abandon hope all ye that enter here," I fancy we should exhaust the possibilities of artistic expression.

The subject is a new one to me, and this may account for the difficulty I feel; but I would venture to suggest that it is just on this point that we might have expected some help or suggestion from Mr. Ayling, as it is the aspect of the case that has the most interest to the architect. And perhaps I might also be allowed to express the regret that many of us feel that it has become the custom at the Institute for members who read Papers on any special class of building to confine themselves to the technicalities of requirements and arrangements, and to ignore the larger and more interesting question of the special opportunities that each different class of building affords for characteristic architectural expression.—Faithfully yours,

A. R. JEMMETT [*F.*].

9 Conduit Street, London, W., 23rd *January* 1909.

CHRONICLE.

THE PRIZES AND STUDENTSHIPS 1909.

The Council's Award.

The Designs and Drawings submitted for the Institute Prizes and Studentships are now on exhibition in the Gallery of the Alpine Club (entrance in Mill Street, Conduit Street, W.). The Council's Deed of Award, read at the General Meeting of the 18th January, gives particulars of the competitions and the results thereof as follows:—

The Royal Institute Silver Medals.

(i.) *The Essay Medal and Twenty-five Guineas.*

Nine Essays on "The Influence on Architecture of Modern Methods of Construction" were received for the Silver Medal under the following mottoes:—

1. "Ictinus."
2. "In Recto Decus."
3. "Modus Operandi."
4. "New Lamps for Old."
5. "Stogs."
6. "The Man o' the Crook."
7. "Vita Nuova."
8. "Void."
9. "X. Y. Z."

The Council have awarded the Medal and Twenty-five Guineas to the author of the Essay submitted under the motto "Void" [*Henry A. Hill, B.A.*], a Prize of Ten Guineas to the author of the Essay submitted under the motto "Vita Nuova" [*Horace Cubitt* [*A.*]], and a Certificate of Hon. Mention to the author of the Essay submitted under the motto "New Lamps for Old" [*J. MacLaren Ross* [*A.*]].

(ii.) *The Measured Drawings Medal and* £10 10*s.*

Nine sets of Drawings were sent in of the various buildings indicated, and under mottoes as follows:—

1. "Antiquis Debetur Veneratio": 6 strainers (Royal Infirmary, Glasgow).
2. "Cistercian": 6 strainers (Fountains Abbey).
3. "Erectheum": 5 strainers (St. Pancras Church).
4. "Esse Quam Videri": 5 strainers (Emmanuel College, Cambridge).
5. "Flint": 5 strainers (Lavenham Parish Church).
6. "Metopemania": 6 strainers (Royal Naval College, Greenwich).
7. "Persiste": 6 strainers (Horham Hall, Thaxted, Essex).
8. "San Gallo": 6 strainers (Church of the Madonna di San Biagio, Montepulciano).
9. "3": 6 strainers (St. Martin's Church).

The Council award the Medal and Ten Guineas to the author of the drawings submitted under the motto "San Gallo" [*Ernest W. Wray*], and a Certificate of Hon. Mention and books to the value of Five Pounds to the author of the drawings submitted under the motto "Flint" [*Alan G. Brace*].

The Travelling Studentships.

(i.) *The Soane Medallion and* £100.

Ten designs for a Casino on the Borders of a Lake were submitted under the following mottoes:—

1. "Centrelines": 5 strainers.
2. "Che Sara Sara": 5 strainers.
3. "Conchitic": 5 strainers.
4. "Gee Ess Ae": 5 strainers.
5. "Nisch": 6 strainers.
6. "Nothing Venture Nothing Win": 5 strainers.
7. "Pan": 5 strainers.
8. "Red Seal" (device): 5 strainers.
9. "Rush": 6 strainers.
10. "Two and One": 6 strainers.

The Council have awarded the Medallion and (subject to the specified conditions) the sum of One Hundred Pounds to the author of the design submitted under the device of a "Red Seal" [*Anthony R. Barker*], and a Certificate of Hon. Mention and Twenty Guineas to the author of the design under motto "Centrelines" [*Adrian Berrington*].

(ii.) *The Owen Jones Studentship and* £100.

One application and drawings were received for the Owen Jones Studentship from S. Herbert Maw (6 strainers). The Council regret that they are unable to award the Certificate, but they award a Prize of Twenty Guineas to *Mr. S. Herbert Maw.*

(iii.) *The Pugin Studentship and* £40.

Nine applications were received for the Pugin Studentship from the following:—

1. John L. Berry: 4 strainers.
2. A. G. Blackford: 4 strainers.
3. H. Hubert Fraser: 4 strainers.
4. L. McD. Gill: 4 strainers.
5. Frank Hearne: 4 strainers.
6. Percy May: 4 strainers.
7. Sydney H. Miller: 4 strainers.
8. A. D. Robinson: 4 strainers.
9. Frank W. Smith: 9 strainers.

The Council have awarded the Medal and (subject to the specified conditions) the sum of Forty Pounds to *Mr. S. H. Miller*, and a Certificate of Hon. Mention and Ten Guineas to *Mr. H. Hubert Fraser.*

(iv.) *The Godwin Medal and £65.*

Two applications were received for the Godwin Bursary from the following:—

1. J. A. O. Allan: 5 strainers.
2. Dixon Spain: 6 strainers.

The Council have awarded the Medal and (subject to the specified conditions) the sum of £65 to *Mr. J. A. O. Allan.*

(v.) *The Tite Certificate and £30.*

Twenty-one designs for a Covered Arcade of Shops were submitted under the following mottoes:—

1. "Arcadia": 3 strainers.
2. "Beloe": 3 strainers.
3. "Burton": 3 strainers.
4. "Clarion": 3 strainers.
5. "Chameleon": 3 strainers.
6. "Dezzezero": 3 strainers.
7. "Eh bien!": 3 strainers.
8. "Ionic": 3 strainers.
9. "Last Man In": 3 strainers.
10. "Maison Rouge": 3 strainers.
11. "Mitre": 3 strainers.
12. "Palladio": 3 strainers.
13. "Peruzzi": 3 strainers.
14. "Red Cross" (device): 3 strainers.
15. "Red Star" (device): 3 strainers.
16. "Rodin": 3 strainers.
17. "Spurs": 3 strainers.
18. "V": 3 strainers.
19. "Veramo": 3 strainers.
20. "Wren": 3 strainers.
21. "Triangle in Circle" (device): 3 strainers.

The Council have awarded the Certificate and (subject to the specified conditions) the sum of Thirty Pounds to the author of the design bearing the motto "Clarion" [*Richard W. M. Gunn*], a Prize of Fifteen Guineas to the author of the design under motto "Last Man In" [*Bertram Edwin Lisle*], and a Prize of Ten Guineas to the author of the design under motto "Dezzezero" [*S. Herbert Maw*].

THE ARTHUR CATES PRIZE: FORTY GUINEAS.

One application only has been received for the Arthur Cates Prize—viz. from Leslie Wilkinson [*A.*] (6 strainers). The Council have awarded the prize to Mr. Leslie Wilkinson.

PRIZES FOR DESIGN AND CONSTRUCTION.

The Grissell Gold Medal and £10 10*s.*

Nine designs for a Landing Stage to a Royal Palace from a Lake were submitted under the following mottoes:—

1. "Architectus": 4 strainers.
2. "Corbel": 4 strainers.
3. "Dies": 6 strainers.
4. "Isis": 5 strainers.
5. "Rex 4 strainers."
6. "Rex 5 strainers."
7. "Rotten": 3 strainers.
8. "Scarlet Scarab" (device): 5 strainers.
9. "Xopher Gubbins": 4 strainers.

The Council have awarded the Medal and Ten Guineas to the author of the design bearing the motto "Dies" [*Douglas William Day*].

THE ASHPITEL PRIZE 1908.

The Council, on the recommendation of the Board of Examiners (Architecture), have awarded the Ashpitel Prize (Books value £10) to *Mr. Horace James Ash*, of Nuneaton, who was registered *Probationer* in 1893, *Student* in 1902, and passed the Final Examination in November 1908.

THE TRAVELLING STUDENTS' WORK.

Soane Medallion 1907.—The Council have approved the drawings executed by Mr. Harold Cooper [*Soane Medallist* 1907], who travelled in Italy, Switzerland, and France.

Owen Jones Studentship 1907.—The Council have approved the work of Mr. Arthur R. H. Jackson [*Owen Jones Student* 1907], who travelled in Northern Italy, Greece, and Turkey.

Tite Prize 1907.—The Council have approved the work of Mr. G. Salway Nicol [*Tite Prizeman* 1907], who travelled in Italy.

Pugin Studentship 1908.—The Council have approved the drawings of Mr. Sydney G. Follett [*Pugin Student* 1908], who travelled in Northamptonshire, Lincolnshire, Oxfordshire, Worcestershire, Gloucestershire, Wiltshire, and Somersetshire.

The Deed of Award bears date 18th January 1909, and is signed by Ernest George, *Chairman*; James S. Gibson, H. V. Lanchester, Alfred W. S. Cross, *Members of Council*; Alexander Graham, *Hon. Sec.*; Herbert G. Tayler, *Assist. Sec.*

Limited Competitions.

Northern Architectural Association, 6 Higham Place, Newcastle-upon-Tyne: 15th January 1909.

The following letter, having reference to the discussion at the Business Meeting of the 18th January, has been handed in for publication:—

DEAR SIR,—At a meeting of the Practice Committee of the Northern Architectural Association, held on the 13th inst., I was requested to intimate to you that the Committee, having perused the report (JOURNAL R.I.B.A., 9 January 1909) on Mr. Gammell's motion *re* Limited Competitions, desire to express their appreciation of the attitude adopted by the Council of the Institute with regard to the matter.—Yours faithfully,

CHARLES S. ERRINGTON,
Hon. Secretary.

The Secretary R.I.B.A.

The Tribunal of Appeal: New Appointment.

The Council, in accordance with Section 178 of the London Building Act 1894, have appointed Mr. John Slater [*F.*] to fill the seat on the Tribunal of Appeal left vacant by the death of Mr. A. E. Gruning.

Amendment of the London Building Act.

At a conference held at the County Hall on the 14th inst., called by the Superintending Architect of the London County Council "to consider the questions raised in Part V. of the Bill," there were present: representatives of the Councils of the Royal Institute of British Architects, the Surveyors' Institution, the Concrete Institute, the Institute of Builders, the London Master Builders' Association, and the District Surveyors' Association, when the following resolution was carried, with one dissentient:—

"That the scope of the said Bill (Part V.) should be limited to the construction of enclosing, *i.e.* external and party, walls."

The Council of the Institute had the matter before them at their Meeting last Monday and passed the following resolution:—

"That the Council of the Royal Institute of British Architects entirely endorses the resolution passed at the conference held at the County Hall on the 14th inst., and urges that the draft Bill should be amended accordingly.

"That a copy of the report of the conference and of this resolution be sent to the Clerk of the London County Council and to the Superintending Architect."

County Surveyors and Private Practice.

The Council of the Royal Institute of the Architects of Ireland passed the following resolution at their meeting on the 5th inst., and ordered a copy to be sent to the secretary of every county council in Ireland:—

"The Council of the Royal Institute of the Architects of Ireland note with satisfaction that the Galway County Council have lately resolved to require their County Surveyor to devote his entire time to the duties of his official position, and the Council of the Institute takes the opportunity of expressing the hope that a similar resolution, but including also the Assistant County Surveyors, may without delay be passed by every County Council in Ireland who have not already done so, inasmuch as it is contrary to the interests of the public service that persons holding the important and responsible position in question should engage in professional competition with architects and engineers, upon whom, moreover, such competition inflicts a serious injustice, which they as ratepayers are justified in strongly protesting against."

The British Museum.

Mr. A. Hamilton Smith, F.S.A., has been appointed Keeper of the Department of Greek and Roman Antiquities in succession to Mr. Cecil Harcourt Smith, LL.D. [*H.A.*], the newly appointed Director of the Victoria and Albert Museum.

Architects' Benevolent Society.

Owing to the fact that extraordinary demands had been made upon the Architects' Benevolent Society last year—the number of applicants for assistance having largely exceeded that of any previous year—the Council of the Institute have contributed £25 towards the Society's income account, in addition to a contribution of £100 made earlier in the year. Recent donations have also been received from Mrs. Arthur Cates £50, Mr. John T. Christopher £22 15*s.* (thus increasing the total sum of his donations to £105), Mr. Arnold Mitchell £10 10*s.*, and Mr. John Borrowman £10 10*s.* Notwithstanding the many and increasing demands on the Society, the number of subscribers shows some falling off. The Treasurer invites the co-operation of members in obtaining additional subscribers.

Concrete Aggregates.

The Special Commission formed by the Executive of the British Fire Prevention Committee "to report upon and define the aggregates suitable for concrete floors intended to be fire-resisting, having due regard to questions of strength, expansion, and the chemical constituents and changes of the aggregates," have issued an interim report, which states that their work has been divided into two sections in charge of two Sub-Committees, the one dealing with Research Work and Tests, and the other with Specifications. The Chairman of the Commission is Sir William Preece, K.C.B., F.R.S.; Chairman of Research and Tests Sub-Committee, Mr. W. T. Hatch, M.Inst.C.E. (representing the Metropolitan Asylums Board); Chairman of Specifications Sub-Committee, Mr. Max. Clarke [*F.*]; Hon. Secretary, Mr. Matt. Garbutt, A.M.Inst.C.E. [*F.*]. The Admiralty, the War Office, and the Norwich Corporation are represented on the Commission, which include also the Chief Engineers of the Manchester Ship Canal, of H.M. Office of Works, and of the Great Northern Railway, the City Engineer, the Deputy Chief Engineer of the Metropolitan Water Board, the Surveyor to the Portman Estate, the Chairman and the Hon. Secretary of the British Fire Prevention Committee, and others.

The Commission find that their inquiry necessitates tests being made over a period of years before final recommendations can be drafted, and that a final report cannot be expected before 1912. Meanwhile, having regard to the divergency of views as to the correct description of the actual materials in use as aggregates, they issue with their interim report the schedule A below, comprising a series of Specifications for Artificial and Natural Materials for Aggregates frequently used in this country for Concrete. These Specifications, the interim report states, may be deemed complete with the exception of (α) the percentage of sulphur allowable in certain of the artificial aggregates, (β) the weight limits for certain volcanic rocks, and (γ) the porosity

of certain clay products, which points can alone be decided after considerable further inquiry and test. The tests necessary prior to framing recommendations should be with Concretes in which aggregates complying with the Specifications as now drafted alone will be used. The Commission consider that the Specifications as they stand, even without any recommendations, should be found useful, and may lead to standardisation in the description of aggregates. As to size to which aggregates should be used to fulfil different purposes, &c., these are also matters for which further research is necessary prior to the recommendation being framed.

SCHEDULE A.—PROVISIONAL SPECIFICATIONS FOR CONCRETE AGGREGATES.

Artificial Materials for Aggregates.

1. *Coke Breeze.*

Coke breeze for use as a concrete aggregate shall be entirely coke taken from the gas retort, coke oven, or special furnace. It shall be absolutely free from clinker, coal, and all substances that will not float in water, and from any admixture of material taken from the retort furnace or water-pan below it, and from cinder, ash, or other admixture. The proportion of sulphur in coke breeze shall not be more than..... per cent.

Note.—It was decided that the determination of the allowable amount of sulphur should be the subject of future consideration.

2. *Clinker.*

Clinker for use as a concrete aggregate shall be the thoroughly burnt and hard waste product of furnaces, free from dust, shale, or free lime, and not having more than.....per cent. of sulphur.

Note.—Pan breeze is included in this definition.

Note.—In this case, as in that of coke breeze, it was decided that the determination of the allowable amount of sulphur should be the subject of further consideration.

3. *Blast Furnace Slag.*

Blast furnace slag for use as a concrete aggregate to be obtained and selected from pig-iron smelting furnaces (to the exclusion of basic slag), to be of porous quality, to be washed to remove dust and sulphur, to be without free lime, and not to contain more than .....per cent. of sulphur.

Note.—In this case also, it was decided that the allowable amount of sulphur should be the subject of further consideration.

4. *Broken Brick.*

Broken brick for use as a concrete aggregate shall be from well-burnt and perfectly sound and hard clay bricks, such as London stock bricks, or bricks of equal quality, and shall be of the size specified, and be free from old mortar and from dust or particles that will pass through a sieve of $\frac{1}{8}$-inch mesh.

5. (*a*) *Gault Clay Burnt.*

Burnt gault clay for use as a concrete aggregate shall be free from free lime and sulphur and from unburnt particles, and shall be thoroughly hard, so that pieces soaked in water for.....hours shall not disintegrate.

Note.—It was decided that the Tests Sub-Committee should be asked to determine the length of time to be inserted in the clause.

5. (*b*) *Ordinary Burnt Clay Ballast.*

Ordinary burnt clay ballast for use as a concrete aggregate shall be free from free lime and sulphur and from unburnt particles, and shall be thoroughly hard, so that pieces soaked in water for.....hours shall not disintegrate.

Note.—It was decided that the Tests Sub-Committee should be asked to determine the length of time to be inserted in the clause.

5. (*c*) *Broken Terra-cotta.*

(1) *Porous.*—Broken porous terra-cotta for use as a concrete aggregate shall be (*a*) from clean and well-burnt earthenware, unglazed, which has been mixed before firing with some combustible material such as sawdust, so that after firing it is of a porous or cellular texture, or (*b*) from clean and well-burnt unglazed earthenware which is capable of absorbing at least .....per cent. of its own weight of water.

(2) *Dense.*—Broken dense terra-cotta for use as a concrete aggregate shall be from clean and well-burnt earthen or stone ware, unglazed, and shall be incapable of absorbing more than.....per cent. of its own weight of water.

Note.—It was decided that the Tests Sub-Committee should be asked to determine the percentages to be inserted in these clauses.

Natural Materials for Aggregates.

6. *Natural Ballast (Gravel).*

Natural ballast for use as a concrete aggregate shall be gravel from river beds, sea coasts or glacial deposits, washed, if necessary, to remove dirt, loam, earthy or saline matter, clay, and other foreign substances.

7. *Volcanic Rocks.*

All rock of volcanic origin for use as a concrete aggregate shall be entirely free from decomposed parts and must show no signs of expansion, disintegration, or dissolution after having been immersed in water for seventy-two hours.

Rocks of this nature may be divided into the following classes :—

(*a*) Basalts, traps, dense lavas, &c., weighing not less than..... lbs. per cubic foot. These shall be dense, thoroughly vitrified, not scoriaceous, show a clean fracture when broken, be homogeneous and free from marked cellular structure.

(*b*) Lavas and rocks of similar character weighing not less than..... .lbs. per cubic foot. These shall be hard and free from all soft or organic matter, but they will not be so hard, and will be more cellular than those of section (*a*).

(*c*) Pumice weighing not more than..... ...lbs. per cubic foot. It shall be hard, free from all organic matter, soft dust or impurity, and show a bright silky structure when broken.

Note.—It was decided that the Tests Sub-Committee should be asked to determine the weights to be inserted in these clauses.

8. *Granite.*

Granite for use as a concrete aggregate shall be obtained from..... [*here insert name of quarry*], and shall be reduced to the specified dimensions by

crushing or breaking, and shall be close, hard, and of even texture; free from large crystals of felspar, dirt, argillaceous or organic materials, all decomposed particles, and from dust that will pass through a $\frac{1}{4}$-inch mesh.

9. *Sandstones, Limestones, Quartzites, and Rocks of Similar Character.*

Rocks of these characters for use as concrete aggregates shall be dense, uniform, and homogeneous in structure and composition. They shall have small, even grains and crystalline texture.* Fractures shall be clean and free from large flaws. The weight of the material shall not be less than 130 lbs. per cubic foot, nor its crushing strength less than 200 tons per square foot, and it shall not absorb more water than 8 per cent. of its weight after immersion for twenty-four hours. The aggregate after preparation shall be free from all dirt, decomposed rock, argillaceous and organic material.

Tests that are deemed to be of immediate necessity are summarised as:—(1) Crushing Tests; (2) Fire Tests; (3) Tests as to the Holding Power of Rods in Concrete; (4) Deterioration Tests; (5) Expansion Tests, and certain chemical tests and analyses.

As regards the continuance of the investigations the Report says:—

Seeing that there are 15 different materials at least to deal with, and that for Crushing Tests the trials should be at 1, 3, 6, 12, 24, and 36 months respectively, the extent of the research necessary is far beyond the time and means available for the Commission to undertake singly. It has thus been deemed advisable that a considerable part of this work shall be distributed among others interested.

The details of the tests have been considered and laid down in a comprehensive manner as a Schedule B. which it is, however, deemed premature to publish at the moment, but to give some idea of the extent of the essential tests only it should be stated that, allowing for 15 different materials, there will be required at least 750 blocks of concrete for crushing tests, 45 large slabs for fire tests, 180 special blocks for holding tests, 288 cylinders for deterioration tests, and 216 blocks for expansion tests.

The British Fire Prevention Committee is prepared to undertake the Fire tests.

The newly formed Concrete Institute is to be invited to undertake the Crushing tests and the tests on the Holding Power of Rods in Concrete.

Mr. A. E. Collins, M.Inst.C.E., of Norwich, has kindly volunteered to undertake the Deterioration tests, and Mr. H. K. G. Bamber, F.C.S., the Expansion tests.

It has been suggested that the reference to the Special Commission should be extended by adding to the word "floors" "and other purposes," whereby the results of the inquiry would probably not only become of greater general utility, but of greater interest to such bodies as the Concrete Institute, to which body the work of the Special Commission may at a later date be most suitably transferred.

* This is not intended to exclude Oolites otherwise suitable.

A Terra-cotta Industry.

Some particulars have been kindly furnished by Lady Baker, widow of Sir Talbot Baker, Bart., of her proposals to establish a terra-cotta industry in white and tinted clays for the counties of Dorset and Hants, in order to bring into prominence the many coloured clays to be found in the two adjoining counties. Some of these clays when treated under certain conditions and baked in a muffled kiln resemble, not only stone, but in many cases delicately tinted marbles. It is the desire of the promoter of this industry to introduce the clays, as in North Italy (where, however, only common red is available), into church, domestic, and garden architecture. This, it is stated, could be done with excellent effect owing to their artistic colouring, and at a price which would place them within the reach of those to whom the cost of stone is prohibitive. In order to carry out her proposals a central depôt and small workshop has been established by Lady Baker at her residence, Forest Garden, Burley, Hants, for artistic work, with a small kiln, where experiments with all sorts and kinds of clays from the two neighbouring counties are constantly being made with the most encouraging results. These experiments take place under her own supervision and with the help of an experienced foreman. Later on, if this first venture is successful, Lady Baker has hopes of opening a depôt in Dorset nearer the white clay beds at Wareham, Westmoors, or elsewhere, for the carrying-out of heavier work, such as the production of a hollow tile, which has been patented for the exclusive use of the industry.

The white clay beds of Dorset have hitherto furnished material for thousands of clever hands outside the county, and even in foreign countries, with but comparatively few who know how to manipulate them artistically in our midst. In a draft circular sent to the Institute Lady Baker says:—"It would seem as if in these days of non-employment we should do well to teach our rising generation how to turn the mineral wealth of the country to its best advantage on the spot. If Dorset but lead the way, Hampshire will not leave it far behind, but may before long set to work and dig in earnest on its own account, and find material and skill to beautify the churches and mansions of the future in a county where stone is none too plentiful."

New evening art classes are being started under the County Councils with a view to training competent and intelligent workers in clay. Members of these classes will be affiliated to the industry and given work where possible under certain conditions and stipulations to ensure sound workmanship and marketable value. A council of advice is being formed to advise the founder on technical and educational questions. Any patents or registered designs taken out by the founder are to become the property of the industry, and if successful

would help to keep it going. Profits, if any, after necessary employment of hands, would be co-operative among the workers.

Carpenters' Hall Lectures.

The Worshipful Company of Carpenters have arranged for the delivery of the following lectures at the Hall of the Company in London Wall:—February 11, "The National Gallery," by Mr. M. H. Spielmann, F.S.A. (Chairman, the Earl of Plymouth); February 18, "Armour," by Viscount Dillon, F.S.A. (Chairman, Mr. J. Seymour Lucas); February 25, "Design and Craft in English Woodwork," by Professor Beresford Pite [*F.*] (Chairman, Mr. T. G. Jackson, R.A.); March 4, "Architecture of Hampton Court," by Mr. Ernest Law, F.S.A. (Chairman, Lord Barnard); March 11, "Ancient Buildings and their Influence on Modern Architecture," by Thackeray Turner [*F.*], F.S.A. (Chairman, Sir Aston Webb, R.A.); March 18, "Timbers of Commerce—their present and possible future Sources of Supply," by Mr. H. J. Elwes, F.R.S. (Chairman, Sir Hugh Beevor, Bart., M.D.). The lectures will be illustrated by lantern views. Entrance is free by ticket to be obtained from the Clerk of the Company.

Memorial to Mr. Bodley.

Subscriptions are invited for a memorial to the late Mr. G. F. Bodley, R.A., to be erected in the Church of the Holy Trinity, Kensington Gore, and to take the form of a reredos from a design left by the late architect. A commemorative tablet with portrait and inscription would be placed in another part of the church. Subscriptions should be sent to the Rev. H. B. Coward, Church of the Holy Trinity, Prince Consort Road, Kensington Gore, S.W.

Old Bordighera: a Correction.

2 *Devonshire Terrace, Portland Place, W:* 16*th January* 1909.

To the Editor JOURNAL R.I.B.A.,—

SIR,—In the interesting account of "Old Bordighera" by Mr. Andrew T. Taylor in the present series of the JOURNAL there is an inadvertent slip which you will perhaps permit me to point out in the interests of accuracy.

On page 99 one of the photographic illustrations is entitled "Saluto di Bordighera." The error is a very obvious one, the word "Saluto" having nothing to do with the subject. The term "Salita" is, on the other hand, very applicable to many of the streets in Bordighera and elsewhere, though neither "Saluto" nor "Salita" is appropriate in the case of the street referred to.—Yours faithfully,

GEORGE HORNBLOWER [*F.*].

REVIEWS.

PLASTERWORK.

The Art of the Plasterer: An Account of the Decorative Development of the Craft, chiefly in England, from the Sixteenth to the Eighteenth Century, with chapters on the Stucco of the Classic Period and of the Italian Renaissance; also on Sgraffito, Pargetting, Scottish, Irish, and Modern Plasterwork. By George P. Bankart, Architect and Craftsman. 4o. Lond. 1908. Price 25s. net. [B. T. Batsford, 94 High Holborn.]

It is but a few years since what seemed to be a very complete work on plastering was produced by the late Mr. Millar, so that there hardly appeared to be room for another book on the same subject—at least for some time. Yet anyone interested in the matter will soon discover, in looking through the pages of Mr. Bankart's book, that plastering, when studied with the eye of an artist who has also the necessary practical knowledge, is one of those arts which are many-sided, and therefore fascinating, and that it is capable of giving expression to high ideals in the decorative side of architecture. It is precisely one of those ancillary arts, so important to the perfection of a building, that no architect should fail to study and to realise the extent to which it may legitimately assist him in the production of an artistic whole.

Mr. Bankart's book is eminently helpful to such a result. Whilst arranged on historical lines, the technical methods are throughout kept in view, so that when describing and illustrating the work peculiar to any epoch the method by which it was produced is also described—at any rate when the means of learning it are to be found by diligent research. And the reader will admit that the book gives ample evidence of the scholarly care with which Mr. Bankart has brought together much scattered information relating to the execution of the finer work. The names of the artists employed on it, whether in Italy, France, or England, are set down where known—and this implies careful reading of the pages of Vasari, Lanzi, and many less known authors. Much in this way was done by Digby Wyatt and others, both as to names and processes; but such information is scattered through sessional papers, and it is a great gain to have them brought together in one work, and to have the artist, his methods and his productions, standing side by side. And what names they are!—some of the greatest in the history of art. We hear much today of the lack of occupation for artists. Is not this partly due to their want of training for any form of art but that which goes into a gilt frame or the page of a book? And would not a good many of them think it derogatory to model mouldings or cornices? If they knew more of the history of art, and of such men as Mr. Bankart enumerates, they might be encouraged to widen their opportunities.

The illustrations are most plentiful, and the

examples selected excellent for their purpose. For such a book photography is invaluable. It gives not only the design, but the very touch and manner of handling, with the exact amount of vigour of relief—information which no drawing on a small scale could possibly give. But Mr. Bankart has added, in some cases, plans and, where needful, sections of mouldings. It would be ungrateful to call any of the figures superfluous; but he has, here and there, repeated illustrations of the same subject rather lavishly, and it is not quite evident why the Wyvenhoe house should have its two illustrations fourteen pages apart (pages 57 and 71), or why those of the Hertford front should be separated by twenty-four pages. He has given excellent bits of that very interesting frieze of old Hardwicke Hall, of which, I think, Richardson gave coloured illustrations in a work published some sixty or more years ago, and which the writer saw (in fairly good preservation) fifty years ago. The New River Company's ceiling is well illustrated, as it deserves to be; the date should have been given (1693), for it is an exceptional example and quite perfect. The ceiling of the chapel in the Royal Hospital, Kilmainham, is also well illustrated. It is one of the largest and most elaborate of the examples of English plasterwork of the time (for although in Ireland it is in no way Irish), and was executed about 1685. There is a curious fact about the technique of this work which may be unknown to Mr. Bankart. The heavy fruits and flowers which form the detail of the borderings are affixed to their grounds by *thorns* of the "blackthorn." When the ceiling was repaired in 1903 these long thorns were found to be perfectly sound after the 220 years of the ceiling's existence.

It is pleasant to know that, numerous as are the illustrations in Mr. Bankart's book, they are but a selection—a good representative one, certainly—of the many hundred examples still existing in this country, many in most unexpected places. I remember some years ago going down to Grays in Essex—hideous with cement factories—and was driven by my host some two or three miles to his house, which externally was a singularly plain and unattractive one, perhaps late eighteenth century. The first room I was shown into had a beautiful little Elizabethan ceiling of the style of that in the "Reindeer" at Banbury, preserved when the house had been "improved" later. There are many houses in old provincial towns, and in the country, where one or two rooms still retain fine ceilings of the seventeenth and eighteenth centuries. But, where the work is purely native, they are always, however effective, coarser in execution than where the Italian was present; and any representation of the figure was clumsy and ill-drawn. The English plasterers seem never to have been trained "from the life" as were the Italians.

Mr. Bankart's book will take a good place among those which deal practically with the artistic capabilities of the crafts subsidiary to architecture, and which are daily receiving more attention—architects are no longer satisfied with the lifeless imitation of form. The value of the touch of the hand is more and more recognised. A merely mechanical skill is no longer regarded as the only perfection; and if more men with the education and training of Mr. Bankart would throw themselves with the same thoroughness and enthusiasm into the practical working of the handicrafts, we might yet see buildings really beautiful, within and without, and arousing fresh interest as each detail is examined. The book has one further merit—it has a good index. J. D. CRACE [*H.A.*].

BRIDGES AND BRIDGE CONSTRUCTION.

The Theory and Practice of Bridge Construction in Timber, Iron, and Steel. By Morgan W. Davies, A.M.I.C.E. 8o. *London*, 1908. *Price* 12*s. net.* [*Macmillan & Co.*]

Architects, as such, do not perhaps often undertake the responsibility for the design of large bridge structures, but as professional men, engaged in constructional practice in brick, in stone, and in steel, they cannot but be interested in all kindred branches of construction, and the subject of bridges is one with which perhaps they are most likely to be concerned.

As stated in the preface, a sad, almost tragic, note is imported into this work on the theory and practice of bridge construction by the regretted death of the author, Mr. Morgan W. Davies, just as the book had reached its completion, and the preface itself is therefore the work of another hand. The work is based upon notes of lectures delivered to students of civil engineering at the Swansea Technical College, the aim of the book being primarily to furnish easily understood rules for the treatment of problems connected with bridge construction. With this object in view the use of higher mathematics has as far as possible been avoided, and an excellent method has been adopted of giving numerous fully worked examples of the various types of existing bridges constructed either of timber or of steel.

The earlier portion of the book is occupied with definitions of various stresses and strains, and diagrams, in considerable detail, of bending moments and shearing forces. These are always to some extent a weak point with beginners, and even in the present book the printed information would probably need a little verbal explanation in places. The distinction between *stress* as an outside force, and *strain* as the effect produced by that force upon a beam or structure, is one which even architects do not always fully enter into. The stresses in framed structures and open trusses of various descriptions are next dealt with analytically and graphically, commencing with the king-post and queen-post and continuing with

various types of open and lattice girders. A word or two of additional explanation might possibly here have been added in one or two instances with advantage; for instance, in discussing a simple trussed girder in the form of an inverted king-post truss, the calculations appear to be based upon the assumption of pivoted joints throughout, without any comment upon the fact that the beam itself has no joints, and is of course continuous throughout the span.

Bowstring girders and cantilever bridges are dealt with on similar lines, the construction of each type being fully analysed. In the case of cantilever bridges mention might have been made of the special stresses to which, as so many eminent engineers have pointed out, large structures of this kind are subject during the actual erection or building out of the cantilevers, such temporary stresses being perhaps entirely different in character from the stresses which the members of the structure will be called upon to bear in the finished bridge. The recent disaster to the great Quebec Bridge while still in course of construction will at once occur to mind in this connection.

Moment of inertia and moment of resistance and the strength of timber, iron, and steel in girders and columns are treated of, special reference being made to the probable effects of *fatigue* of iron and steel under the conditions met with in bridge practice. The way in which the various formulæ given are grouped or tabulated for reference will appeal to most students, and it is to be wished that this conciseness of arrangement were more generally followed in other text-books. The deflection of beams and trusses and the theory of continuous girders of two or more spans are also touched upon at some length.

The most valuable part of the book for the ordinary reader is, however, the portion dealing with the *practice* of bridge construction. Details of riveted joints and connections are first given, then examples of the calculation of wind pressures, loads on arches and framed structures under various conditions, and the construction of masonry arches and steel or iron arched ribs. The complete details of the method of calculation involved in each case cannot of course be included within the scope of the book, but sufficient indication is given to enable the student to obtain a good general grasp of the subject. Suspension bridges and details of their construction and methods of suspension and anchorage, and also such special types as lifting bridges and swing bridges, are also included. The comparatively new form of bridge known as the *pont à transbordeur*, or "transporter" bridge, is also given a special chapter.

The illustrations of the construction of various types of steel bridge, given under the head of "Floors of Bridges," are more particularly applicable to railway and highway bridges; but details are also given of the construction of masonry piers and foundations of various kinds, as well as of timber or trestle piers and bridges, together with such useful illustrations as those showing the construction of end bearings, bed plates, and expansion rollers. The tables of British standard sections and the worked examples of bridge designing in timber and steel given in the concluding chapter form a very useful conclusion to the work, and will no doubt prove of considerable service to students and others taking up the book.

Architects could perhaps have wished to have included in such a work at least one chapter on the architecture of bridges from an æsthetic point of view, and it is hoped that the *rapprochement* between the architect and the engineer, already an established fact in other countries, will eventually enable the two professions to work together in all classes of public work for the public pleasure and for the public good.

WILLIAM R. DAVIDGE [*A.*].

FONTS AND FONT COVERS.

Fonts and Font Covers. By Francis Bond, M.A. Illustrated by 426 photographs and measured drawings. 8vo. 1908. Price 12s. net. [Henry Frowde, Oxford University Press.]

It appears to have become the fashion of late years to neglect Gothic as somewhat out of date and to be studied merely with a view to satisfying examiners. No doubt the new fields in Renaissance work which have been opened up may have done something to foster this spirit; but the student should not forget that a proper and intelligent appreciation of Mediæval work in its many developments is essential to a full understanding of the present-day arts.

The excellent series of works on Gothic Architecture and its accessories now being produced by Mr. Francis Bond cannot fail to revive the interest in Mediæval work. Since the publication of his valuable work on Gothic Architecture, Mr. Bond has written about Church Screens, and he has now produced a comprehensive and scholarly book on Fonts and Font Covers. The only previous attempts to treat of fonts in historical series were those by Simpson and Coombe (the latter being better known as Paley's Fonts), but these contain little more than a brief introduction to the subject and a number of examples. Mr. Bond is the first to undertake seriously a wide and comprehensive treatment of the whole subject, and he does this in a scholarly and pleasantly written volume replete with excellent photographic illustrations. The book is divided, broadly, into two divisions, historical and analytical.

When open streams were not available, as in towns, baptism among the early Christians was administered in tanks either below or upon the surface of the ground, and these tanks in many places, notably in Italy, developed into large and

important Baptisteries; but the great importance attached in the early days to the Sacrament of Baptism received a check when it became the general custom to baptize infants, and Mr. Bond traces the gradual decline from the tank down to the metal or earthenware bowl of post-Reformation times. In Norman times it became necessary to mount the font on legs for convenience in administering the rite to infants. He also quotes a number of authorities tending to dispose of the idea that total immersion was the ancient form of baptism for adults.

FONT AT BRIDEKIRK, CUMBERLAND.
From *Fonts and Font Covers.*

An attempt is made to classify fonts according to their external design, but there are a number which seem to defy all attempts at classification. The symbolic meaning attached to the form of

fonts is lightly touched on, Mr. Bond not being a believer in the symbolic use of the number eight as applied to an octagonal font; but I think it should be borne in mind that, although the original use of the eight-sided font may not have had a symbolic meaning, it was certainly accounted so in comparatively early times, and the idea may have influenced later designers.

A brief chapter is given on metal and wooden fonts, and a number of excellent examples in lead are illustrated, with a list of all the known examples.

There are many interesting inscribed fonts still in existence, beginning with the beautiful example at Bridekirk in Cumberland, with its Runic inscription, which has caused experts to vary so widely in their opinions as to its age.

FONT AT HITCHIN.
From *Fonts and Font Covers.*

In Part III. the author deals with English fonts historically, beginning with pre-Conquest examples, which he considers may exist in greater numbers than is generally thought. A very large number of Norman fonts still survive: the majority of these are mounted, the unmounted ones being generally circular. Mouldings are the safest guide to dates, but the reader is warned that the details of a font are probably later than similar work on the structure of the church, owing to the time which would elapse before the craftsman could become thoroughly familiar with them. Great richness of carved ornament and sculpture is the distinguishing feature of the eleventh and twelfth century fonts. Arcading became a popular mode of decorating the sides, no doubt because of its convenience in affording niches for images. Much of the figure sculpture illustrates incidents in the lives of holy persons, and Mr. Bond relates the legends most commonly met with. There is an interesting series of fonts of black marble made in Tournai and imported into this country. They are all supported on five legs, the central one being very massive, and are all richly carved.

The great majority of thirteenth-century fonts are of black marble, chiefly from Purbeck, but also obtained from Petworth and Bethersden. These are very uniform in design, having usually square or octagonal bowls resting on five legs. There are also to be found many freestone copies of these designs. The great difference between the richness of the Norman fonts and the simplicity of those made in the Early English period was no doubt due to the hardness of the material and the risk of damage in transit from the "factory." Another class of thirteenth-century fonts are those made of local freestone, other than mere copies of marble examples, and they are distinguished by a great diversity in design and a quiet restraint in the use of ornament. Marble went out of fashion in the fourteenth century, and font design became standardised, the bowl being nearly always polygonal, usually an octagon. Sometimes the font was unmounted, but more often it was set on a polygonal pedestal. The period was one of lavish ornament, rich detail being used wherever possible, and usually with exquisite taste. The most popular device for ornamenting the sides of the octagon was by means of niches under ogee arches, one of the most original and successful being the twelve-sided font at Hitchin, Herts.

A vast number of fonts were re-made during the fifteenth century and up to the Dissolution. The tendency to copy and plagiarise became very pronounced during this period, and the re-introduction of much figure sculpture is a chief characteristic, the *motif* being probably more religious than artistic. Many fonts show traces of rich colouring and gilding.

A list is given of the series of Seven Sacrament fonts, nearly all of which are in East Anglia. A number of illustrations of the panels of the Gresham font are given, though by a slip the titles "Matrimony" and "Ordination" are interchanged. Mr. Bond gives us a painful chapter on Desecration of Fonts, and some interesting matter relative to post-Reformation examples.

In Part IV. Mr. Bond has had the benefit of Mr. E. C. Eden's assistance in describing Font Covers, a subject not before so fully treated of. Font covers originated in the desire to prevent the consecrated water, which was retained for a time in the font, from being stolen for the purposes of "black magic." The early forms were merely flat wooden lids secured by an iron bar and padlock, but later on they became, especially in East Anglia, towering tabernacles of openwork tracery, richly painted and gilded. Some covers were movable, being usually suspended above the font with a counterpoise; others stood on the floor, and were provided with doors for access. A good example of the latter treatment may be found at Thaxted, Essex. There is a fourteenth-century stone cover or enclosure round the font at Luton, Beds (not Herts, as in Index Locorum).

The book is illustrated with no fewer than 126 photographic examples, all to a large scale, and the work of reference is much facilitated by a useful Index Locorum and an Index Rerum; and, although a critic might be able to point out a printer's slip here and there, these do not in any way detract from the interest and usefulness of the book, which I can cordially recommend to anyone, lay or professional, who takes an interest in old fonts. It is by far the best work yet published on the subject.

A. WHITFORD ANDERSON [A.].

MINUTES. VII.

At the Sixth General Meeting (Ordinary) of the Session 1908-09, held Monday, 18th January 1909, at 8 p.m.—Present: Mr. Ernest George, *President*, in the Chair, 21 Fellows (including 7 members of the Council), 37 Associates (including 1 member of the Council), and numerous visitors—the Minutes of the Meeting held Monday, 4th January 1909 [p. 188], were taken as read and signed as correct.

The following Associates attending for the first time since their election were formally admitted by the President:—William Baird, James Sydney Cable, Henry Valentine Milnes Emerson, and Bryan Watson.

A Paper on PUBLIC ART[illegible] having been read by the author, Mr. R. Stephen Ayling [*F.*], and discussed, the thanks of the Meeting were passed to him by acclamation.

The Assistant Secretary having read the Deed of Award of Prizes and Studentships 1909 made by the Council under the Common Seal, the sealed envelopes bearing the mottoes of successful competitors were opened and the names declared.

The proceedings then closed, and the Meeting separated at 10 p.m.